

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

MCKESSON AUTOMATION, INC.

Plaintiff,

v.

SWISSLOG ITALIA S.p.A. and
TRANSLOGIC CORPORATION,

Defendants.

C.A. No. 06-028 SLR/LPS

**REVISED ATTACHMENTS TO MCKESSON AUTOMATION, INC.'S
OPENING CLAIM CONSTRUCTION BRIEF [D.I. 351]**

Plaintiff McKesson Automation, Inc. hereby submits revised Exhibit E – part 1 (M0125295 – M0125390); Exhibit E – part 2 (MA000056 – MA000156); Exhibit E – part 3 (MA000157 - MA000274); and Exhibit I (MA000275 – MA000448) as attachments to McKesson's Opening Claim Construction Brief. The Exhibits were revised to add the Bates production numbers that correlate to citations contained in the Opening Brief, to facilitate identification.

Respectfully submitted,



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Counsel for Plaintiff McKesson Automation, Inc.

DATED: September 4, 2008

CERTIFICATE OF SERVICE

I hereby certify that on this 4th day of September, 2008, I served by email and electronic filing the REVISED ATTACHMENTS TO McKESSON AUTOMATION, INC.'S OPENING CLAIM CONSTRUCTION BRIEF using CM/ECF, which will send notification of such filing to the following:

Julia Heaney, Esquire
MORRIS, NICHOLS ARSHT & TUNNELL
1201 N. Market Street
P.O. Box 1347
Wilmington, DE 19899

I also certify that, on this 4th day of September, 2008, I served the aforementioned document, by CM/ECF and Federal Express to the following participants:

Lawrence C. Drucker, Esquire
Alfred R. Fabricant, Esquire
Richard LaCava, Esquire
Bryan N. DeMatteo, Esquire
DICKSTEIN SHAPIRO LLP
1177 Avenue of the Americas
New York, NY 10036



Dale R. Dubé (I.D. No. 2863)

Exhibit E

Part 1

ABANDONED

SERIAL NUMBER (Series 1487) 17/469217		PATENT DATE		PATENT NUMBER	
SERIAL NUMBER 07/469,217	FILING DATE 01/24/90	CLASS 364	SUBCLASS 178	GROUP ART UNIT 236	EXAMINER TRAMMELL

APPLICANT: SEAN C. MC DONALD, PITTSBURGH, PA; ELLEN J. HERTZ, PITTSBURGH, PA;
JAMES A. SMITH, ALLISON PARK, PA; GREGORY TOTO, PITTSBURGH, PA.

****CONTINUING DATA*******
VERIFIED
DM

****FOREIGN/PCT APPLICATIONS*******
VERIFIED
DM

FORGIGN FILING LICENSE GRANTED 02/22/90 ***** SMALL ENTITY *****

Foreign priority claimed 35 USC 119 conditions met	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	AS FILED	STATE OR COUNTRY PA	SHEETS DRWGS. 14	TOTAL CLAIMS 23	INDEX CLAIMS 6	FILING FEE RECEIVED \$ 239.00	ATTORNEY'S DOCKET NO. 1797003
Verified and Acknowledged <i>DM</i>								

ADDRESS: ANSEL M. SCHWARTZ *Jerry J. Alstadt*
ALDER COHEN AND GREGORY
625 LIBERTY AVE. *5604 Buchanan Ingersoll P.C.*
PITTSBURGH, PA 15222 *15219*

TITLE: SYSTEM FOR ~~FILING ORDERS~~
Selecting and Delivering Packages from Holding area to Fill orders

U.S. DEPT. of COMM.-Pat. & TM Office - PTO-436L (rev. 10-78)

PARTS OF APPLICATION
FILED SEPARATELY

NOTICE OF ALLOWANCE MAILED <i>Jan. 23, 92</i>		PREPARED FOR ISSUE <i>1-31-92</i> <i>DM Trammell</i> Assistant Examiner <i>DM</i> Docket Clerk <i>Harold</i>		CLAIMS ALLOWED Total Claims <i>13</i> Print Claim <i>1</i>	
ISSUE FEE Amount Due <i>\$ 565.00</i> Date Paid		JERRY SMITH SUPERVISORY PATENT EXAMINER ART UNIT 236 Primary Examiner		DRAWING Sheets Drwg. <i>14</i> Figs. Drwg. <i>14</i> Print Fig. <i>1 and 5</i>	
Label Area		ISSUE CLASSIFICATION Class <i>364</i> Subclass <i>478</i>		ISSUE BATCH NUMBER <i>W52</i>	
		WARNING: The information disclosed herein may be restricted. Unauthorized disclosure may be prohibited by the United States Code Title 35, Sections 122, 181 and 368. Possession outside the U.S. Patent & Trademark Office is restricted to authorized employees and contractors only.			

07/469217



APPROVED FOR LICENSE

FEB 02 9 016

INITIALS

Entered
or
Counted

CONTENTS

Received
or
Mailed

1.	Application <u>14th</u> papers.	
2.	<u>Repetition 3 mos.</u>	<u>5/10/94/1/1</u>
3.	<u>X time 3 mo change of address</u>	<u>11-4-91</u>
4.	<u>And A</u>	<u>11-4-91</u>
5.	<u>PH. And</u>	<u>1/23/92/-22-</u>
6.	<u>Rest P/A</u>	<u>11-4-91</u>
7.	<u>Notice of Acceptance</u>	<u>1-30-91</u>
8.	ABANDONED	OCT 22 1992
9.	<u>Request for Secor</u>	<u>1/24/06</u>
10.	<u>Request for Access</u>	<u>12-4-06</u>
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M0125296

STAPLE AREA

* U.S. GOVERNMENT PRINTING OFFICE 1990-275-917

PATENT NUMBER		ORIGINAL CLASSIFICATION	
		CLASS	SUBCLASS
		364	478
APPLICATION SERIAL NUMBER		CROSS REFERENCE(S)	
07/46217			
APPLICANT'S NAME (PLEASE PRINT)		CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)
Sean C. McDonald et al.		364	413.02
IF REISSUE, ORIGINAL PATENT NUMBER		414	273
INTERNATIONAL CLASSIFICATION (INT. CL. 15)		GROUP	ASSISTANT EXAMINER (PLEASE STAMP OR PRINT FULL NAME)
B65G	1/00	ART UNIT	Jim Hammell
G06F	15/46		
		2306	Primary Examiner (PLEASE STAMP OR PRINT FULL NAME)
			Jerry Smith
PTO 270 (10-94)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	

ISSUE CLASSIFICATION SLIP

M0125297

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INDEX OF CLAIMS

Claim	Final	Original	Date
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SYMBOLS

✓ Rejected

✗ Allowed

- (through number) Disposed

..... Notified

N Non-elected

I Interference

A Appeal

O Objected

Claim	Final	Original	Date
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M0125298

SEARCHED			
Class	Sub.	Date	Exmr.
364	478 479 413.01 413.02 385 281 7 15	4/14/01	JPT
Search	update	1/14/02	JPT
414	788 788A 7902 7979 266 261 273 253 235 234 240	1/14/02	JPT

INTERFERENCE SEARCHED			
Class	Sub.	Date	Exmr.
As shown above		1/14/02	JPT

SEARCH NOTES		
APS terms:	Date	Exmr.
medin?	4/17/01	JPT
Medic?		
Drug #		
Box code?		
order#		
Package		
Prescription		
pill		
Computer		
cpu		
microprocessor		
processor		
Automatic storage retrieval		
ADS update terms:	1/14/02	JPT
Package		
rod		
computer		
cpu		
microprocessor		
processor		
controller		
Automatic storage retrieval		

07/469217

PATENT APPLICATION SERIAL NO. _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

060 01/30/90 07469217

1 201 265.00 CK

BN30118 02/07/90 07469217

01-0693 030 201 26.00CR

PTO-1556
(5/87)

M0125300

U/469217



PATENT

Docket No. 1797.003

Commissioner of Patents and Trademarks
Washington, D.C. 20231

NEW APPLICATION TRANSMITTAL

Transmitted herewith for filing is the patent application of

Inventor(s): Sean C. McDonald, Ellen J. Hertz, James A. Smith,
Gregory Toto

WARNING: Patent must be applied for in the name(s) of all of the actual inventor(s). 37 CFR 1.41(a) and 1.53(b).

For (title): A SYSTEM FOR FILLING ORDERS

1. Type of Application

This new application is for a(n) (check one applicable item below):

- ☒ Original
☐ Design
☐ Plant

WARNING: Do not use this transmittal for a completion in the U.S. of an International Application under 35 U.S.C. 371(c)(4) unless the International Application is being filed as a divisional, continuation or continuation-in-part application.

NOTE: If one of the following 3 items apply then complete and attach ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF A PRIOR U.S. APPLICATION CLAIMED.

- ☐ Divisional
☐ Continuation
☐ Continuation-in-part (CIP)

CERTIFICATION UNDER 37 CFR 1.10

I hereby certify that this New Application Transmittal and the documents referred to as enclosed therein are being deposited with the United States Postal Service on this date January 24, 1990 in an envelope as "Express Mail Post Office to Addressee" Mailing Label Number MB137703082 addressed to the: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Tracey L. Milka

(Type or print name of person mailing paper)

Tracey L. Milka
(Signature of person mailing paper)

NOTE: Each paper or fee referred to as enclosed herein has the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 CFR 1.10(b).

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2. Benefit of Prior U.S. Application(s) (35 USC 120)

NOTE: If the new application being transmitted is a divisional, continuation or a continuation-in-part of a parent case, or where the parent case is an International Application which designated the U.S., then check the following item and complete and attach ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

- ☐ The new application being transmitted claims the benefit of prior U.S. application(s) and enclosed are ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

3. Papers Enclosed Which Are Required For Filing Date Under 37 CFR 1.53(b) (Regular) or 37 CFR 1.153 (Design) Application

14 Pages of specification

8 Pages of claims

1 Pages of Abstract

14 Sheets of drawing

- ☐ formal
☒ informal

WARNING: DO NOT submit original drawings. A high quality copy of the drawings should be supplied when filing a patent application. The drawings that are submitted to the Office must be on strong, white, smooth, and non-shiny paper and meet the standards according to § 1.84. If corrections to the drawings are necessary, they should be made to the original drawing and a high-quality copy of the corrected original drawing then submitted to the Office. Only one copy is required or desired. Comments on proposed new 37 CFR 1.84. Notice of March 9, 1988 (1990 O.G. 57-62).

NOTE: "Identifying indicia such as the serial number, group and unit, title of the invention, attorney's docket number, inventor's name, number of sheets, etc., not to exceed 2 1/4 inches (7.0 cm.) in width may be placed in a centered location between the side edges within three fourths inch (19.1 mm.) of the top edge. Either this marking technique on the front of the drawing or the placement, although not preferred, of this information and the title of the invention on the back of the drawings is acceptable." Proposed 37 CFR 1.84(f). Notice of March 9, 1988 (1990 O.G. 57-62).

4. Additional papers enclosed

- ☐ Preliminary Amendment
☐ Information Disclosure Statement
☐ Form PTO-1449
☐ Citations
☐ Declaration of Biological Deposit
☐ Authorization of Attorney(s) to Accept and Follow Instructions from Representative
☐ Special Comments
☐ Other

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5. Declaration or oath

☒ Enclosed

executed by (check all applicable boxes)

☒ inventor(s).☐ legal representative of inventor(s). 37 CFR 1.42 or 1.43☐ joint inventor or person showing a proprietary interest on behalf of inventor who refused to sign or cannot be reached.☐ this is the petition required by 37 CFR 1.47 and the statement required by 37 CFR 1.47 is also attached. See item 13 below for fee.☐ Not Enclosed.

WARNING: Where the filing is a completion in the U.S. of an International Application but where a declaration is not available or where the completion of the U.S. application contains subject matter in addition to the International Application the application may be treated as a continuation or continuation-in-part, as the case may be, utilizing ADDED PAGE FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION CLAIMED.

☐ Application is made by a person authorized under 37 CFR 1.41(c) on behalf of all the above named inventor(s). The declaration or oath, along with the surcharge required by 37 CFR 1.16(e) can be filed subsequently.

Note: It is important that all the correct inventor(s) are named for filing under 37 CFR 1.41(c) and 1.53(b).

☐ Showing that the filing is authorized. (Not required unless called into question. 37 CFR 1.41(d).

6. Inventorship Statement

WARNING: If the named inventors are each not the inventors of all the claims an explanation, including the ownership of the various claims at the time the last claimed invention was made, should be submitted.

The inventorship for all the claims in this application are:

☒ The same

or

☐ Are not the same. An explanation, including the ownership of the various claims at the time the last claimed invention was made,

☐ is submitted.

☐ will be submitted.

7. Language

NOTE: An application including a signed oath or declaration may be filed in a language other than English. A verified English translation of the non-English language application and the processing fee of \$30.00 required by 37 CFR 1.17(k) is required to be filed with the application or within such time as may be set by the Office. 37 CFR 1.52(d).

NOTE: A non-English oath or declaration in the form provided or approved by the PTO need not be translated. 37 CFR 1.69(b).

☒ English☐ non-English

☐ the attached translation is a verified translation. 37 CFR 1.52(d).

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8. Assignment☒ An assignment of the invention to Automated Healthcare, Inc.☒ is attached.☐ will follow.**9. Certified Copy**

Certified copy(ies) of application(s)

(country)	(appln. no.)	(filed)
(country)	(appln. no.)	(filed)
(country)	(appln. no.)	(filed)

from which priority is claimed

☐ is(are) attached.☐ will follow.

Note: The foreign application forming the basis for the claim for priority must be referred to in the oath or declaration, 37 CFR 1.55(a) and 1.63.

NOTE: This item is for any foreign priority for which the application being filed directly relates. If any parent U.S. application or International Application from which this application claims benefit under 35 U.S.C. 120 is itself entitled to priority from a prior foreign application then complete item 18 on the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

10. Fee Calculation (37 CFR 1.16)**A.** ☒ Regular application

CLAIMS AS FILED						
	Number filed		Number Extra		Rate	Basic Fee \$370.00
Total						
Claims	23	- 20 =	3	X	\$ 12.00	36.00
Independent						
Claims (37 CFR 1.16(b))	6	- 3 =	3	X	\$ 36.00	108.00
Multiple dependent claim(s), if any (37 CFR 1.16(d))					\$120.00	

☐ Amendment cancelling extra claims enclosed.☐ Amendment deleting multiple dependencies enclosed.☐ Fee for extra claims is not being paid at this time.

NOTE: If the fees for extra claims are not paid on filing they must be paid or the claims cancelled by amendment, prior to the expiration of the time period set for response by the Patent and Trademark Office in any notice of fee deficiency, 37 CFR 1.16(d).

Filing Fee Calculation \$ 514.00

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B. ☐ Design application

(\$150.00—37 CFR 1.16(f))

Filing Fee Calculation

\$ _____

C. ☐ Plant application

(\$250.00—37 CFR 1.16(g))

Filing fee calculation

\$ _____

11. Small Entity Statement(s)

- ☒
- Verified Statement(s) that this is a filing by a small entity under 37 CFR 1.9 and 1.27 is(are) attached.

Filing Fee Calculation (50% of A, B or C above)

\$ 257.00

NOTE: Any excess of the full fee paid will be refunded if a verified statement and a refund request are filed within 2 months of the date of timely payment of a full fee. 37 CFR 1.28(a).

12. Request for International-Type Search (37 CFR 1.104(d)) (complete, if applicable)

- ☐
- Please prepare an international-type search report for this application at the time when national examination on the merits takes place.

13. Fee Payment Being Made At This Time

- ☐
- Not Enclosed

- ☐
- No filing fee is to be paid at this time. (This and the surcharge required by 37 CFR 1.16(e) can be paid subsequently.)

- ☒
- Enclosed

- ☒
- basic filing fee

\$ 257.00

- ☒
- recording assignment
-
- (\$8.00; 37 CFR 1.21(h))

\$ 8.00

- ☐
- petition fee for filing by other
-
- than all the inventors or person
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- on behalf of the inventor where
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- inventor refused to sign or cannot
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- be reached. (\$120.00; 37 CFR
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- 1.47 and 1.17(h))

\$ _____

- ☐
- for processing an application with
-
- a specification in a non-English
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- language. (\$30.00; 37 CFR 1.52(d) and
-
- 1.17(k))

\$ _____

- ☐
- processing and retention fee
-
- (\$120.00; 37 CFR 1.53(d) and 1.21(l))

- ☐
- fee for international-type search report (\$30.00;
-
- 37 CFR 1.21(e)).

\$ _____

NOTE: 37 CFR 1.21(f) establishes a fee for processing and retaining any application which is abandoned for failing to complete the application pursuant to 37 CFR 1.53(d) and this, as well as the changes to 37 CFR 1.53 and 1.78, indicate that in order to obtain the benefit of a prior U.S. application, either the basic filing fee must be paid or the processing and retention fee of § 1.21(f) must be paid within 1 year from notification under § 53(d).

Total fees enclosed

\$ 265.00

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14. Method of Payment of Fees

- ☒ Check in the amount of \$ 265.00 (CK. #164)
☐ Charge Account No. 8.00 (CK. #165) in the amount of \$_____ A duplicate of this transmittal is attached.

NOTE: Fees should be itemized in such a manner that it is clear for which purpose the fees are paid. 37 CFR 1.22(b).

15. Authorization to Charge Additional Fees

WARNING: If no fees are to be paid on filing the following items should not be completed.

WARNING: Accurately count claims, especially multiple dependent claims, to avoid unexpected high charges, if extra claim charges are authorized.

- ☒ The Commissioner is hereby authorized to charge the following additional fees by this paper and during the entire pendency of this application to Account No. 01-0693:
- ☒ 37 CFR 1.16(a), (f) or (g) (filing fees)
☒ 37 CFR 1.16(b), (c) and (d) (presentation of extra claims)

NOTE: Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must only be paid or these claims cancelled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 CFR 1.16(d)), it might be best not to authorize the PTO to charge additional claim fees, except possibly when dealing with amendments after final action.

- ☐ 37 CFR 1.16(e) (surcharge for filing the basic filing fee and/or declaration on a date later than the filing date of the application)
☐ 37 CFR 1.17 (application processing fees)

WARNING: While 37 CFR 1.17(a), (b), (c) and (d) deal with extensions of time under § 1.136(a) this authorization should be made only with the knowledge that: "Submission of the appropriate extension fee under 37 C.F.R. 1.136(a) is to no avail unless a request or petition for extension is filed." (Emphasis added). Notice of November 5, 1985 (1060 O.G. 27).

- ☐ 37 CFR 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37 CFR 1.311(b))

NOTE: Where an authorization to charge the issue fee to a deposit account has been filed before the mailing of a Notice of Allowance, the issue fee will be automatically charged to the deposit account at the time of mailing the notice of allowance. 37 CFR 1.311(b).

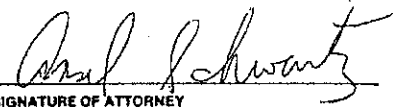
NOTE: 37 CFR 1.28(b) requires "Notification of any change in loss of entitlement to small entity status must be filed in the application . . . prior to paying, or at the time of paying, . . . issue fee". From the wording of 37 CFR 1.28(b): (a) notification of change of status must be made even if the fee is paid as "other than a small entity" and (b) no notification is required if the change is to another small entity.

16. Instructions As To Overpayment

- ☒ credit Account No. 01-0693
☐ refund

Reg. No. 30,587

Tel. No. (412) 394-4900


 SIGNATURE OF ATTORNEY

Ansel M. Schwartz, Esquire

Type or print name of attorney

Alder, Cohen & Grigsby, P.C.

P.O. Address 2900 CNG Tower

625 Liberty Avenue

Pittsburgh, PA 15222

(Application Transmittal [4-1]—page 6 of 7)

M0125306

☐ **Incorporation by reference of added pages**

Check the following item if the application in this transmittal claims the benefit of prior U.S. application(s) (including an international application entering the U.S. stage as a continuation, divisional or C-I-P application) and complete and attach the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED

☐ Plus Added Pages For New Application Transmittal Where Benefit Of Prior U.S. Application(s) Claimed

Number of pages added _____

☐ Plus Added Pages For Papers Referred To In Item 4 Above

Number of pages added _____

☒ **Statement Where No Further Pages Added**

(If no further pages form a part of this Transmittal then end this Transmittal with this page and check the following item)

☒ This transmittal ends with this page.

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M0125307



265.12-201

A

07/469217

~~A SYSTEM FOR FILLING ORDERS~~FIELD OF THE INVENTION

The present invention relates to filling orders. More specifically, the present invention relates to the automated filling of prescription and automated restocking of medicines used for filling the orders.

BACKGROUND OF THE INVENTION

Currently, in large hospital environments, doctors visit patients in nursing units and write out medication orders for each patient. A patient is typically placed on a certain medication treatment which requires multiple doses of medication over a period of a day. Some medications are administrated at certain times of the day and possibly at intervals of several hours. Patients may also request certain medications on an elective basis for disorders such as headaches. These requests are included in the doctor's order that is sent from the nursing unit to the central pharmacy of the hospital.

Once an order is received by the pharmacy, it is checked by registered pharmacists and input into the pharmacy information system. These orders reflect not only orders that are added to a particular patient's treatment but changes in the medication treatment. The pharmacy information system combines this information with the patient's existing medication schedule and develops a patient medication profile. A fill list is generated from that profile. The fill list is a list of all the medications that must be distributed to all patients for the day. This information is sent to the pharmacy printer where a hard copy is generated.

At this point, the drugs for a particular patient are hand picked by either a pharmacist or a pharmacy technician and placed in the particular patient's designated box. A registered pharmacist must then check the accuracy of the patient order before it leaves the pharmacy. Individual patient boxes are then loaded into a large cassette and delivered to the nursing unit.

Approximately 30% of the drugs dispensed each day are returned to the pharmacy unused. Since each drug is individually packaged, the drugs must be returned to the pharmacy stock. Patients are then credited for unused medication. This

1 return and crediting process is a very time consuming task and requires significant
2 amount of pharmacy man power.

3 Currently, this is a very time consuming, man power intensive task. In a typical
4 large pharmacy up to 35 pharmacists and pharmacy technicians are responsible for all
5 aspects of the unit dose dispensing task. Because this process is done manually a
6 certain amount of error exists. Studies have estimate that a half percent error rate is
7 typical in a large hospital. Since a hospital may dispense over 6000 doses each day,
8 this error rate leads to a significant number of missed or incorrect doses.

9 Several companies have tried to automate this process through various
10 approaches to the problem. Meditrol, utilizes a vending machine approach to dispense
11 the unit dose medications. Each nursing unit must have it's own stock of prescription
12 drugs. Nurses key in a patient ID and the drugs for that patient are then dispensed
13 from the vending machine. This system is very expensive due to the necessity of
14 purchasing a system for each nursing unit. Also, restocking each machine is a very
15 time consuming task. Implementation of the system requires a complete modification of
16 the current drug dispensing process which many hospitals are reticent to undertake.
17 The system claims no labor saving advantages from it's implementation. This system
18 is covered under patent number 3,917,045 titled "Drug Dispensing Apparatus" and
19 dated Nov. 11, 1975.

20 Baxter Travenol uses a dispensing system from Samsung, a Korean company,
21 which dispenses bulk solids into a package which is dispensed to the pharmacist. This
22 system only dispenses the 200 most frequently used solids. A typical hospital
23 formulary can contain over 1500 different medications, many in liquid, syringe or bottle
24 form. These medications must be manually picked by the pharmacy.

25 Neither system allows the dispensed medications to be automatically returned
26 to the storage area.

27 In the preferred embodiment of the invention described herein, the Automated
28 Pharmacy Station™, or APS™, is able to dispense all dosage forms currently
29 contained in a hospital pharmacy. Medicines are automatically dispensed by the
30 system per a patient order and placed in medication boxes for the pharmacist's check.
31 Each drug is individually barcoded so that the accuracy of the dispensing process can
32 be automatically checked by the system. Once drugs are returned to the pharmacy the
33 system automatically returns the drugs to it's inventory and credits the patient's
34 account for the drugs dispensed. The hospital will recognize significant labor savings
35 as well as savings based on improved accuracy in the dispensing function and better
36 tracking of inventory and expired medications.

1
2 SUMMARY OF THE INVENTION
3

4 The present invention pertains to a system for filling orders, such as
5 prescriptions for patients. The system comprises means for holding packages. Each
6 package has the same type of contents being held in a predetermined location by the
7 holding means. Each package has an identity which defines the contents therein. The
8 holding means has a plurality of predetermined locations corresponding to a plurality
9 of different types of contents. Additionally, the system is comprised of means for
10 supplying packages to the holding means. Also, there is a means for picking a
11 package from the holding means that is identified in the order for the purpose of filling
12 the order, or from the supplying means for the purpose of restocking the holding
13 means. The picking means is in communication with the holding means and the
14 supplying means.

15
16 In the preferred embodiment, the contents of each package is a single dose of
17 medicine.
18
19

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings, the preferred embodiments of the invention and preferred methods of practicing the invention are illustrated in which :

Figure 1 is a schematic representation of a system for filling orders.

Figure 2 is a side view of a package.

Figure 3 is a perspective view of a schematic representation of a storage structure.

Figure 4a is a perspective view of a schematic representation of an end of arm tooling.

Figure 4b is a side cutaway representation of an end of arm tooling.

Figure 4c is a schematic representation of the mounting means for an end of arm tooling.

Figure 5 is a schematic representation of a side view of a support structure 28 with the tooling structure.

Figure 6a is a perspective view of a schematic representation of a rod connected to a back rod support bar.

Figure 6b is a schematic representation of a side view of a first rod and a second rod in a support structure.

Figure 7 is a schematic representation of an overhead view of an alternative system for filling an order.

Figure 8 is a flowchart of the filling process.

Figure 9 is a flowchart of the check process.

Figure 10 is a flowchart of the return process of medicines packages from a nursing unit.

Figure 11 is a flowchart of the restocking process.

1
2
3 DESCRIPTION OF THE PREFERRED EMBODIMENT
4

5 Referring now to the drawings wherein like reference numerals refer to similar or
6 identical parts throughout the several views, and more specifically to Figure 1 thereof,
7 there is shown a schematic representation of a system 10 for filling orders, such as
8 prescriptions for patients. The system 10 is comprised of means 12 for holding
9 packages. Each package has the same type of contents, such as a same type of
10 medicine and preferably a single dosage of the medicine. Each package having the
11 same medicine is held at a predetermined location by the holding means 12. Each
12 package 14 has an identity 16, preferably a bar code, which defines the contents, and
13 preferably the dosage of and expiration date of the medicine contained therein, as
14 shown in Figure 2. Figure 2 is a schematic representation of a package 14.

15
16 For instance, in a preferred embodiment the package 14 could have A equal 3.50
17 inches, B equal 1.0 inches, C equal 3.0 inches and D equal 0.1875 inches.
18 Alternatively, the package 14 can have A equal 5 inches, B equal 1.25 inches, C equal
19 5.0 inches and D equal 0.1875 inches. The holding means 12 has a plurality of
20 predetermined locations 18 corresponding to a plurality of different types of contents,
21 such as medicines, as shown in Figure 3. Figure 3 is a schematic representation of a
22 perspective view of the holding means 12.

23
24 An individual dose of medicine can be manually fed into an automated packaging
25 system 98, as shown in Figure 1, which automatically seals the package and prints a
26 barcode label directly on the package. In a preferred embodiment there is utilized the
27 H-100™ packaging system as manufactured by Automated Packaging Systems of
28 Twinsburg, Ohio. With the addition of the Accu-Print™ 100 Programmable In-Line
29 Direct Transfer Imprinter, also manufactured by Automated Packaging Systems, a
30 barcode label can be printed directly on the medicine package.

31
32 The system 10 is also comprised of means 20, such as a restock rack, for supplying
33 packages 14 to the holding means 12, as shown in Figure 1. There is also means 22
34 for picking a package 14 from the holding means 12 that is identified in the order, such
35 as a prescription, for the purpose of filling that prescription, or from the supplying

1 means 20 for the purpose of restocking the holding means 12. The picking means 22
2 is in communication with the holding means 12 and the supplying means 20.

3

4 The system 10 is also comprised of means 43, such as a pneumatic actuator, for
5 allowing the system 10 to position the picking means 38, in front of either holding
6 means 12, as shown in Figure 4. In the preferred embodiment, the picking means 38,
7 is mounted on a support rod 41 attached to the Y dimension of the tooling support
8 structure 44. A conceptual drawing of this device is described in Figure 8. This
9 structure 41, has means 45, for pneumatically flipping the picking means 38,
10 approximately 180°, such that the face of the gripper 38, is parallel to the X dimension.
11 This is activated in order to retrieve medicines as described below from either side of
12 the holding means 12.

13

14 The picking means 22 can include a computer 24, or local area network of computers,
15 having a database. The database has the order, such as a prescription, to be filled,
16 and a record of the predetermined locations 18 of, for instance each different medicine
17 in the holding means 12. The computer 24 guides the picking means 22 based on
18 information contained in the database such that the picking means 22 picks a
19 medicine package 14 according to the prescription to be filled. The picking means 22
20 can also include means, such as a bar code reader 26 as shown in Figure 4a, for
21 determining the identity 16 of a medicine package 14 in the supplying means 20 and
22 providing its identity 16 to the computer 24. The computer 24 guides the picking
23 means 22 such that the holding means 12 is restocked with the identified medicine
24 package 14 from the supplying means 20 according to the medicine in the medicine
25 package 14 and its predetermined location 18 in the holding means 12 that is known
26 by the computer 24.

27

28 The holding means 12 can include a structure 28 as shown in Figure 3. The holding
29 means 12 can also include support rods 30 held by the structure 28. The rods 30 hold
30 the medicine packages 14, as shown in Figure 6a. Each rod 30 is associated with a
31 given medicine and holds medicine packages 14 with only the same medicine.

32

33 The structure 28 can include a plurality of back rod supports 32 from which the rods 30
34 extend. The back rod supports 32 snap into place in the structure 28, as is well known
35 in the art. The structure 28 with rod supports 32 forms an X,Y coordinate system with
36 each rod 30 and medicine packages 14 therein having a unique X,Y coordinate. The

1 picking means 22 is disposed adjacent to the structure 28, as shown in Figure 1, such
2 that a given medicine package 14 on an associated rod 30 can be picked by the
3 picking means 22 to fill a patient's prescription; or a given medicine package 14 in the
4 supplying means 20 can be picked by the picking means 22 to restock an associated
5 rod 30.

6
7 The system 10 can include a conveyor 34 in communication with the picking means
8 22. The system can also include patient prescription boxes 36 which are moved by
9 the conveyor 34 to the picking means 22 such that the picking means 22 provides the
10 medicine packages 14 that are picked to fill a given prescription to an associated box
11 36.

12
13 The picking means 22 can include at least one end of arm tooling 38, as shown in
14 Figures 4a and 4b, that picks the medicine packages 14. Figure 4a is a perspective
15 view of a schematic representation of the end of arm tooling 38. Figure 4b is a
16 simplified side view of the end of arm tooling. The picking means 22 also can include
17 a tooling support structure 40, as shown in Figure 5. The tooling support structure has
18 at least one column 44 to support the tooling 38 and at least one row 42 to support the
19 column 44 such that the tooling 38 in a housing 49 thereof moves along the column 44
20 under the power of a drive motor 47 to pick a given medicine package 14 hanging
21 from a corresponding support rod 30; or restock a given medicine package 14 on a
22 corresponding support rod 30. The picking means 22 can also include means 46 for
23 moving the column 44 with respect to the row 42. The moving means 46 is controlled
24 by the computer 24.

25
26 The end of arm tooling 38 is preferably comprised of a housing 49, as shown in Figure
27 4a. The tooling 38 is also comprised of means for storing medicine packages 14, such
28 as a storing rod 48, attached to the housing 49. The tooling 38 is also comprised of
29 means 50 for obtaining a medicine package 14. The obtaining means 50 is slidably
30 attached to the housing 49 such that it can move in a Z direction, which is
31 perpendicular to the X,Y directions, to pick a medicine package 14 from a support rod
32 30 in the support structure 28 to which the housing 49 is adjacent and with which it is
33 aligned. The identifying means, for example, the bar code reader 26, is mounted on
34 the end of arm tooling 38 such that it can identify a package 14 to be picked by the
35 obtaining means 50.

36

1 The obtaining means 50 preferably includes means for producing a suction, such as
2 an air line 55 controlled by a vacuum valve 54. The obtaining means 50 also
3 preferably includes an extension rod 52 in fluidic communication with a pneumatic
4 cylinder 53, as shown in Figure 4b. The extension rod 52 is slidingly attached with
5 respect to the Y and Z directions to the housing 49. A suction is maintained through
6 the air lines 55 when the vacuum valve 54 is activated. The obtaining means 50 also
7 can include a suction head 56 connected to the extension rod 52 through which a
8 medicine package 14 is picked with suction. The obtaining means 50, preferably also
9 includes means 58 for sensing when a package 14 is properly positioned on the
10 suction head 56 for example by detecting air flow therethrough. The suction head 56
11 is then moved to the storing means, such as the storing rod 48, to deposit the package
12 14 thereon. Preferably, the storing means is a storing rod 48 which extends from the
13 housing 49 such that the suction head 56 and the extension rod 52 can deposit a
14 package 14 thereon.

15
16 The extension rod 52 can move in the Y and Z directions to place a picked package 14
17 on the storing rod 48 under the action of vacuum valves and cylinders 51 and 53. The
18 vacuum valve 57 activates cylinder 51 to move both the cylinder 53 and the extension
19 rod 52 in the Y direction. The vacuum valve 59 activates cylinder 53 to move the
20 extension rod in the Z direction. The vacuum valve 54 provides suction to the air lines
21 55 and suction head 56 sufficient to pick a package 14 from a rod 30 of the support
22 structure 28 and then hold it to the suction head 56. The suction head 56 preferably
23 has two faces 60 and 61 through which suction can be drawn. One face 60 is capable
24 of picking a package 14 off of a rod 30 of the support structure 28 and the other face 61
25 is capable of picking a package 14 off of a storing rod 48. Preferably, the two faces 60
26 and 61 are parallel to each other and are parallel to the X axis. Each package 14
27 preferably has a face 62 and the packages 14 are held by the storing rod 48 and the
28 rods 30 of the support structure 28 such that the face 62 of each package is parallel to
29 the X axis. The outside face 60 is utilized when a package 14 is being removed from a
30 rod 30, and the inside face 61 is utilized when a package 14 is being removed from
31 the storing rod 48.

32
33 In an alternative embodiment, the rods 30 extend from the double rod support bar 64
34 in sets of two as shown in Figure 6b. A first rod 65 and a second rod 66 of each set
35 point essentially in the Z direction, but approximately 180 degrees apart from each
36 other. The picking means 22 includes a first end of arm tooling 67 and a second end

1 of arm tooling 68 that picks the medicine packages 14; and a first tooling support
2 structure 70 and a second tooling support structure 72 as shown in Figure 7. Each
3 tooling support structure has at least one column 44 and at least one row 42 to support
4 the column 44 such that the first and the second tooling moves along the respective
5 column 44 and the respective column 44 moves along the respective row 42 of the first
6 and second tooling support structure, respectfully, to pick a given medicine package
7 14 from a corresponding support rod 30, or restock a support rod 30 with an
8 associated medicine package 14.

9
10 In the operation of the preferred embodiment, doctors visit patients in nursing units and
11 write out medication orders for each patient. A patient is typically placed on a certain
12 medication treatment which requires multiple doses of medication over a period of a
13 day. Some medications are administrated at certain times of the day and possibly at
14 intervals of several hours. Patients may also request certain medications on an
15 elective basis for disorders such as headaches. These requests are included in the
16 doctor's order that is sent from the nursing unit to the central pharmacy of the hospital.
17 Once an order is received by the pharmacy, it is checked by registered pharmacists
18 and input into the pharmacy information system. These orders reflect not only orders
19 that are added to a particular patient's treatment but changes in the medication
20 treatment. The pharmacy information system combines this information with the
21 patient's existing medication schedule and develops a patient medication profile. A fill
22 list is generated from that profile. The fill list is a list of all the medications that must be
23 distributed to all patients for the day. This information is sent to the pharmacy printer
24 where a hard copy is generated.

25
26 Means for communication between the pharmacy information system and the
27 Automated Pharmacy Station™ (APS™) exists by either tapping the serial data print
28 stream of the pharmacy information system or by a direct bi-directional communication
29 link. The relevant information concerning the patient including drug type, dosage and
30 frequency is placed in the database of the APS™, see Figure 8. The database of the
31 APS™ contains information about which drugs are to be dispensed that day to the
32 patient and all drugs that have been dispensed in the past to the patient. Information
33 from the pharmacy information system is received on an ongoing basis throughout the
34 day. New information can be entered into the APS™ at any time. In addition to the fill
35 list, new orders and patient admittance, discharge and transfer information are
36 received and stored. A specific prescription for a patient is filled as described in Figure

1 8. Figure 8 is a flow chart with respect to the processing of a patient prescription. The
2 patient box 36 is placed on the conveyor 34. When the turn comes for the patient box
3 36 to be filled, it has been shuttled into a position on the conveyor 34 such that the end
4 of arm tooling 38 can communicate with the box 36 by way of the tooling structure 40
5 as shown in Figure 1. A stationary bar code reader 90 reads the bar code on the
6 patient box 36. The patient identification number is then parsed from the bar code
7 input. This causes the fill list for that particular patient to be retrieved from the APS™
8 database. The fill list is converted to data consisting of locations and number of picks.
9 The data is then downloaded in order for the computer 24 to control the end of arm
10 tooling 38 such that it knows what packages 14 to obtain and place in the patient box
11 36.

12
13 The specific medicine package 14 is picked by the column 44 moving along the row
14 42 until the column 44 has the same X coordinate as the medicine package 14 it
15 desires to obtain. The end of arm tooling 38 then moves along the column 44 to the Y
16 coordinate of the medicine package to be picked. It is also turned to the proper
17 holding means 12 (either the first holding means 12a or the second holding means
18 12b) which has the desired package 14. These actions may also be performed
19 simultaneously by the system. The tooling support structure utilized is a Hauser™
20 HLE linear drive.

21
22 When the end of arm tooling 38 is properly positioned, the suction rod 52 extends in
23 the Z direction by pneumatic cylinder 53 such that the outside suction face 60 contacts
24 the package face 62. The barcode reader 26 reads the identity 16 on the medicine
25 package 14 in order to confirm that it is the proper medicine package to be picked with
26 respect to the patient's prescription. The vacuum valve 54 activates a suction through
27 the air lines 55 such that a suction drawn through the suction face 60 grabs the
28 medicine package 14. When the contact is proper between the suction face 60 and
29 the medicine package 14, the sensing means 58 sends a signal to the valve 59
30 causing the extension rod 52 to retract from the rod 30 of the support structure 28,
31 pulling the medicine package 14 with it. Once the medicine package 14 is clear of the
32 rod 30, the extension rod 52 positions the medicine package 14 that it has obtained,
33 upon the storing rod 48.

34
35 Once the medicine package 14 is on the storing rod 48, the vacuum valve 54
36 terminates the suction and the medicine package is released from the suction face 60.

1 The vacuum valve 57 then activates the cylinder 51 such that the extension rod 52
2 (and cylinder 53) are moved in the Y direction so the bottom of the suction head 56 is
3 above the package 14 on the storing rod 48. The extension rod is then moved forward
4 in the Z direction and downward in the Y direction by the respective valves and
5 cylinders to clear the package and position the suction head 56 for the next pick. The
6 computer 24 then notes that the medicine package 14 with the appropriate medicine
7 has been picked. The process is repeated for all the medicine identified in the
8 patient's prescription until all of the medicine packages 14 needed have been picked.

9
10 The end of arm tooling then positions itself with respect to the row 42 and column 44
11 such that it is over the patient box 36. The end of arm tooling then positions the
12 outside suction face 60 behind the medicine packages on the storing rod 48 that have
13 been collected and strokes forward in the Z direction so that all packages 14 are
14 pushed off the storing rod 48 into the patient box 36.

15
16 More specifically, vacuum valve 57 activates the cylinder 51 to retract in the positive Y
17 direction such that the bottom of the suction head 56 is above the tops of the packages
18 14 on the storing rod 28. Then vacuum valve 59 activates cylinder 53 to retract the
19 extension rod 52 in the negative Z direction such that the outer suction face 60 is
20 behind all of the medicine packages 14 on the storing rod 48. Vacuum valve 57 is
21 then activated such that the suction head 56 is dropped back down in the negative Y
22 direction to be behind the packages 14. Finally, vacuum valve 59 is activated such
23 that the extension rod 52 is extended in the positive Z direction and the front suction
24 face 60 pushes all packages 14 off the storing rod 48 into the patient box 36.

25
26 In the event that the wrong medicine package 14 was scanned and is picked, or the
27 medicine has expired, then the end of arm tooling 30 is moved to an empty portion of
28 the return area, where the medicine package 14 can be disposed. A pharmacy
29 technician will then manually sort the drugs on this rack, removing expired drugs and
30 placing the others in the return rack in order that they might be returned to their correct
31 location in the system. The process is then repeated for the next drug on the
32 prescription list that has not yet been obtained.

33
34 After a patient's prescription is filled and the patient box 36 has all the medicine
35 packages called for in the prescription, a conveyor belt 34 moves the patient box 36 to
36 a check station 80. An operator uses the check station bar code reader 82 to scan the

1 bar code label on the filled patient box 36, see Figure 9. The patient identification
2 number is taken from the inputted bar code and the prescription of the patient is
3 displayed on the check station screen 84 of the check station console 86 connected to
4 the computer or network of computers 24. The operator then scans individual medicine
5 package bar codes in the patient box 36. The identity of the medicine packages 14 in
6 the patient box 36 are automatically checked for correctness with respect to the patient
7 list on the station screen 84. If the medicine packages 14 in the box 36 are correct,
8 then the patient box is allowed to continue on towards the ultimate destination and the
9 next filled patient box 36 is then checked. If the medicine packages 14 in the patient
10 box 36 are not correct, then it is determined whether the error, whatever that may be,
11 can be corrected. If it can, then the record on the check station screen 84 is corrected
12 and the procedure for verifying correctness is then repeated. If the problem cannot be
13 corrected, then the patient box 36 is dumped and the computer is notified that the
14 patient's prescription has not yet been filled.

15
16 With respect to the return process, see Figure 10, the patient box 36 is first removed
17 from a cassette returned from a nursing unit. An operator uses the return station
18 barcode scanner 91 on the return station 92 to scan the bar code on the patient box
19 36. The nursing unit number and the patient identification number is then parsed from
20 the inputted bar code of the patient box 36. The APS™ database is then accessed
21 and the patient dispensing record is retrieved. On the return screen 94, there is
22 displayed for a particular patient at the operator console 96, a list of the medicines
23 ordered and dispensed to the patient. The operator of the return station 92 then scans
24 the identity 16 of the medicine in the patient's box 36 with the return station bar code
25 scanner 91. The medicine packages 14 that are found thereon are verified as being
26 dispensed to the patients. The expiration date of the medicine in the medicine
27 package 14 is then determined. If the expiration date of a medicine in the medicine
28 package 14 has passed, then the medicine package 14 is discarded. If the expiration
29 date has not passed then the returned medicine package 14 is placed in the return
30 rack 20. If there is more medicine to be returned, the process is then repeated. If there
31 is no more medicine in the patient box 36 to return, then the return station console 96
32 is checked to verify the correctness of the medicine returned. If the screen is correct,
33 then the return record is accepted and the APS™ database is updated. If the screen
34 94 is incorrect, then the screen is corrected to correspond to the returned medicine
35 packages 14 and the patient box 36.
36

1 The APS™ data base is then accessed in order to retrieve the patient numbers and
2 locations transferred or admitted to the nursing unit. If a new patient has been
3 transferred into that particular hospital bed, the system generates a barcode
4 containing his/her patient identification number. This label is placed on the patient box
5 to reflect the present patient in that hospital bed.

6
7 If there are more patient boxes 36 in the cassette, then the bar code on the next patient
8 box 36 is scanned and the return process continues as described above. This process
9 is repeated for each cassette returned from the patient floor.

10
11 When medicine packages 14 are to be restocked to the structure 28, see Figure 11,
12 the return rack is placed in a predetermined position alongside the structure 28. By
13 being placed in a predetermined position, the rods X and Y coordinates are known to
14 the computer 24. The end of arm tooling 38 is then positioned for a given rod in the
15 return rack. The bar code reader 26 on the end of arm tooling 38 then scans the
16 identity 16 of the medicine package 14 that is about to be picked by the end of arm
17 tooling 38. The process of picking the medicine packages 14 onto the storing rod 48
18 of the end of arm tooling 38 is the same as identified above with respect to the process
19 of obtaining medicine packages 14 from the support structure 28. The only difference
20 is that the order of the medicine packages 14 and their identity as they are picked is
21 saved in the computer 24. When the storing rod 48 is then moved to the support
22 structure 28, in order to restock rods 30 therein, the computer knows the identity of the
23 respective medicine package 14 on the storing rod 48 which is about to be placed
24 back onto the corresponding rod 30 of support structure 28.

25
26 The placement of the package 14 from the storing rod 48 to the storage rod 30 of the
27 support structure 28 occurs in the following manner. The extension rod 52 is retracted
28 in the negative Z direction such that the inside suction face 61 is in contact with the
29 medicine package 14. The sensing means 58 determines whether proper contact is
30 made. Then the extension rod 52 is moved a predetermined distance in the positive Z
31 direction to place the medicine package over a rod 30 of support structure 28.
32 Vacuum valve 54 is then deactivated to stop suction, allowing the medicine package
33 14 on the suction face 61 to drop away therefrom. The extension rod 52 then moves in
34 the negative Z direction towards the medicine packages 14 on the storing rod 48 again
35 to repeat the process. While it moves back to obtain another medicine package 14,
36 the sensor 58 trips when contact is made. The process can be repeated until there are

1 no more medicine packages 14 on the storing rod 48. The computer 24 knows when
2 to stop returning packages since it knew how many packages were placed on the
3 storing rod 48 to begin with.

4
5 The restocking of the support structure 28 can be carried out during the evening when
6 the medicine is not being gathered by the end of arm tooling 38. Alternatively,
7 restocking can be carried out simultaneously with picking if the system 10 has a pair of
8 rods as shown in Figure 6b, a first end of arm tooling 67, second end of arm tooling 68
9 and a first tooling structure 70 and a second tooling structure 72 is utilized, as shown
10 in Figure 7. While, for instance, the first end of arm tooling 67 is picking medicine
11 packages 14 to fill a patient's prescription, the second end of arm tooling 68 can be
12 restocking the second side of the storage area 12.

13
14 Although the invention has been described in detail in the foregoing embodiments for
15 the purpose of illustration, it is to be understood that such detail is solely for that
16 purpose and that variations can be made therein by those skilled in the art without
17 departing from the spirit and scope of the invention except as it may be described by
18 the following claims.

WHAT IS CLAIMED IS:

1. A system for filling orders comprising:

means for holding packages, each package having the same type of contents being held at a predetermined location by the holding means, said holding means having a plurality of predetermined locations corresponding to a plurality of different types of contents;

means for supplying packages to the holding means; and

means for picking a package from the holding means that is identified in the order, or from the supplying means for the purpose of restocking the holding means, said picking means in communication with the holding means and supplying means.

2. A system for filling prescriptions for patients comprising:

means for holding packages, each medicine package having an identity which defines the medicine therein, each package that has the same medicine being held at a predetermined location by the holding means, said holding means having a plurality of predetermined locations corresponding to a plurality of different medicines;

means for supplying medicine packages to the holding means; and

means for picking a medicine package from the holding means that is identified in a patient's prescription in order to fill the prescription, or from the supplying means in order to restock the holding means, said picking means in communication with holding means and the supplying means.

3. A system for filling prescriptions for patients comprising:

means for holding medicine packages, each package having a single dosage of medicine, each medicine package having an identity which defines the dosage and medicine therein, each package that has the same medicine being held at a predetermined location by the holding means, said holding means having a plurality of predetermined locations corresponding to a plurality of different medicines;

means for supplying medicine packages to the holding means;

means for picking a medicine package from the holding means that is identified in a patient's prescription in order to fill the prescription, or from the supplying means in order to restock the holding means, said picking means in communication with the holding means and the supplying means.

4. A system as described in Claim 3 wherein the picking means includes a computer having a database, said database having a prescription to be filled, and the predetermined locations of each different medicine in the holding means, said computer guiding said picking means with said database such that the picking means picks a medicine package according to the prescription to be filled.

5. A system as described in Claim 4 wherein said picking means includes means for determining the identity of a medicine package in the supplying means and providing its identity to the computer, said computer guiding said picking means such that the holding means is restocked with the identified medicine package from the supplying means according to

the medicine in the medicine package and its predetermined location in the holding means that is known by the computer.

Sub 1 ⁶ A system as described in Claim 5 wherein the holding means includes a structure, and support rods held by the structure, said rods holding the medicine packages, each rod associated with a given medicine and holding medicine packages with only the same medicine.

a ² ~~holding means~~ ² A system as described in Claim ¹ ~~8~~ wherein the ~~structure~~ includes a plurality of back rod supports from which the rods extend, said structure with back rod supports form an X,Y coordinate system with each rod and medicine packages therein having a unique X and Y coordinate, said picking means disposed adjacent said structure such that a given medicine package on an associated rod can be picked by the picking means to fill a patient's prescription; or a given medicine package in the supplying means can be picked by the picking means to restock an associated rod.

³ ~~8~~ A system as described in Claim ² ~~7~~ including a conveyer in communication with the picking means; and patient prescription boxes which are moved by the conveyer to the picking means such that the picking means provides the medicine packages it has picked to fill a given prescription to an associated box.

⁴ ~~5~~ A system as described in Claim ³ ~~8~~ wherein the picking means includes at least one end of arm tooling that picks the medicine packages; and a tooling support structure having at least one column to support the tooling and at least one row to support the column such that the tooling moves along the column as the column moves along the row to pick a given medicine package hanging from a corresponding support rod, or restock a given medicine package on a corresponding support rod; and means

for moving the column with respect to the row, said moving means controlled by the computer.

⁵10. A system as described in Claim ⁴9 wherein the tooling is comprised of:

a housing;

means for storing medicine packages attached to the housing;

means for obtaining a medicine package, said obtaining means slidably attached to the housing such that it can move in a Z direction, which is perpendicular to the X and Y direction, to pick a medicine package from a support rod in the support structure when the housing is adjacent to and aligned with a support rod, and can move in the Z direction to place a picked package on the storing means; and

wherein the identifying means is part of the end of arm tooling such that it can identify a package to be picked by the obtaining means, each of said packages having an identity disposed on them which can be read by the identifying means.

⁶11. A system as described in Claim ⁵10 wherein the identity on each package is a bar code, and the identifying means includes a bar code reader disposed on the obtaining means.

⁷12. A system as described in Claim ⁶11 wherein the obtaining means includes means for producing a suction; a suction rod in fluidic connection with the suction producing means, said suction rod slidably attached with respect to the Y and Z directions to the housing and maintaining a suction therethrough when the suction producing means is activated;

a suction head connected to the suction rod through which a medicine package is picked with suction; and means for sensing when a package is properly positioned on the suction head such that the suction rod is then moved to the storing means and deposits the package thereon.

⁸ 13. A system as described in Claim ⁷ 12 wherein the storing means is a storing rod which extends from the housing such that the suction head and the suction rod can deposit a package thereon.

⁹ 14. A system as described in Claim ⁸ 13 wherein the tooling includes valves and pneumatic cylinders for moving the suction rod in the Y and Z direction; and a vacuum pump for providing suction to the suction rod and suction head sufficient to pick a package from a rod of the support structure and then hold it to the suction head.

¹⁰ 15. A system as described in Claim ⁹ 14 wherein the suction head has two faces through which a suction can be drawn, each face capable of picking a package.

¹¹ 16. A system as described in Claim ¹⁰ 15 wherein the two faces are parallel to each other and are parallel to the x-axis, and wherein each package has a face and the packages are held by the storing rod and the rods of the support structure such that the face of each package is parallel to the x-axis.

¹² 17. A system as described in Claim ³ 8 wherein the rods extend from the back rod supports in sets of two, with a first rod and a second rod of each set pointing essentially in a Z direction, which is perpendicular to the X and Y directions, but approximately 180° apart from each other, and wherein the picking means includes a first and a second end of arm tooling that picks

the medicine packages; and a first and a second tooling support structure, each tooling support structure having at least one column and at least one row to support the column, such that the first and the second tooling moves along the respective column and the respective column moves along the respective row of the first and second tooling support structure, respectively, to pick a given medicine package from a corresponding support rod, or restock a support rod with an associated medicine package.

18. A system as described in Claim 1 wherein each package has an identity which defines the contents therein.

19. A system for filling orders comprising:

means for holding packages, each package having the same type of contents being held at a predetermined location by the holding means, each package having an identity which defines the contents therein, said holding means having a plurality of predetermined locations corresponding to a plurality of different type of contents; and

means for picking a package from the holding means that is identified in the order, said picking means in communication with the holding means.

20. A system for filling orders comprising:

first means for holding packages, and second means for holding packages, each package having the same type of contents being held at a predetermined location by the first and second holding means, said first and second holding means having a plurality of predetermined locations corresponding to a plurality of different types of contents; and

means for picking a package from the first or second holding means that is identified in the order, said picking means disposed between and in communication with the first and second holding means.

21. A system as described in Claim 20 wherein each holding means includes a structure; and support rods held by the structure, said rods holding the packages, each rod associated with a given package.

a 1322. A system as described in Claim ¹⁶21 wherein the picking means includes at least one end of arm tooling that picks the packages; and a tooling support structure having at least one column to support the tooling and at least one row to support the column such that the tooling moves along the column as the column moves along the row to pick a given package hanging from a corresponding support rod, said end of arm tooling able to turn on the column to pick packages on either the first or second holding means; and

means for moving the column with respect to the row, said moving means controlled by a computer and in communication therewith.

23. An end of arm tooling comprising:

a housing;

means for storing packages attached to the housing;

means for obtaining a package, said obtaining means slidably attached to the housing such that it can move to pick a package from a support rod in a support structure when the housing is adjacent to and aligned with a support rod, and then move to place a picked package on the storing means; and

means for identifying a package to be obtained by the
obtaining means, said identifying means connected to the housing.

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ABSTRACT OF THE DISCLOSURE

A SYSTEM FOR FILLING ORDERS

A system for filling orders, such as prescriptions for patients, comprising a device for holding packages. Each package has the same type of contents being held in a predetermined location by the holding device. Each package has an identity which defines the contents therein. The holding device has a plurality of predetermined locations corresponding to a plurality of different types of contents. Additionally, the system is comprised of a device for supplying packages to the holding device. Also, there is a device for picking a package from the holding device that is identified in the order for the purpose of filling the order, or from the supplying device for the purpose of restocking the holding device. The picking device is in communication with the holding device and supplying device. In a preferred embodiment, the contents of each package is a single dosage of medicine.



PATENT

Attorney's Docket No. 1797.003

Applicant or Patentee: Sean C. McDonald, et al.

Serial or Patent No.: 0 /

Filed or Issued:

For: A SYSTEM FOR FILLING ORDERS

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
STATUS (37 CFR 1.9(f) and 1.27(c))—SMALL BUSINESS CONCERN**

I hereby declare that I am

- ☐ the owner of the small business concern identified below:
☒ an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN Automated Healthcare, Inc.ADDRESS OF CONCERN Suite 211, 3920 Old William Penn Highway,
Pittsburgh, PA 15235

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third-party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed, to and remain with the small business concern identified above with regard to the invention, entitled

A SYSTEM FOR FILLING ORDERS

by inventor(s) Sean C. McDonald, Ellen J. Hertz, James A. Smith
Gregory Toto

described in

- ☒ the specification filed herewith,
☐ application serial no. 0 / , filed
☐ patent no: , issued

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below* and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR 1.9(d) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27).

(Small Entity—Small Business [7-4]—page 1 of 2)

M0125331

NAME _____

ADDRESS _____

☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

NAME _____

ADDRESS _____

☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small business entity is no longer appropriate. (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING Sean C. McDonaldTITLE OF PERSON OTHER THAN OWNER PresidentADDRESS OF PERSON SIGNING Automated Healthcare, Inc.Suite 211, 3920 Old William Penn Highway, Pittsburgh, PA 15235

SIGNATURE



Date

1/17/90

Page 1 of 2

Declaration and Power of Attorney For Patent Application English Language Declaration

As a below named inventor, I hereby declare that

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

A SYSTEM FOR FILLING ORDERS

the specification of which

(check one)

☒ is attached hereto.

☐ was filed on _____ as

Application Serial No. 0 /

and was amended on _____
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

Priority Claimed

(Number) _____	(Country) _____	(Day/Month/Year Filed) _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
(Number) _____	(Country) _____	(Day/Month/Year Filed) _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No
(Number) _____	(Country) _____	(Day/Month/Year Filed) _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application

Form PTO-FB-150 (9-43)

Patent and Trademark Office-U.S. DEPARTMENT OF COMMERCE

(Declaration and Power of Attorney—English Language [1-12]—page 1 of 2)

M0125333

Page 2 of 2

0 / (Application Serial No.) (Filing Date) (Status)
(patented, pending, abandoned)

0 / (Application Serial No.) (Filing Date) (Status)
(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith (list name and registration number)

Andrew J. Cornelius, Reg. No. 29,142; Ansel M. Schwartz, Reg. No. 30,587

Send Correspondence to:

Ansel M. Schwartz, Esquire 412/394-4987
Direct Telephone Calls to (name and telephone number)

Full name of first or last inventor: Sean C. McDonald 1/17/90
Inventor's signature: *Sean C. McDonald*
Residence: 582 East End Avenue, Pittsburgh, PA 15221 USA
Citizenship: United States
Post Office Address: 582 East End Avenue, Pittsburgh, PA 15221 USA

Full name of second joint inventor, if any: Ellen J. Hertz 1/17/90
Second inventor's signature: *Ellen J. Hertz*
Residence: 5446 Wilkins Avenue, Pittsburgh, PA 15217 USA
Citizenship: United States
Post Office Address: 5446 Wilkins Avenue, Pittsburgh, PA 15217 USA

(Supply similar information and signature for third and subsequent joint inventors.)

Form PTO-FB-110 (6-43)

Patent and Trademark Office-U.S. DEPARTMENT OF COMMERCE

(Declaration and Power of Attorney—English Language [1-12]—page 2 of 2)

M0125334

**ADDED PAGE TO COMBINED DECLARATION AND POWER OF ATTORNEY
FOR SIGNATURE BY THIRD AND SUBSEQUENT INVENTORS**

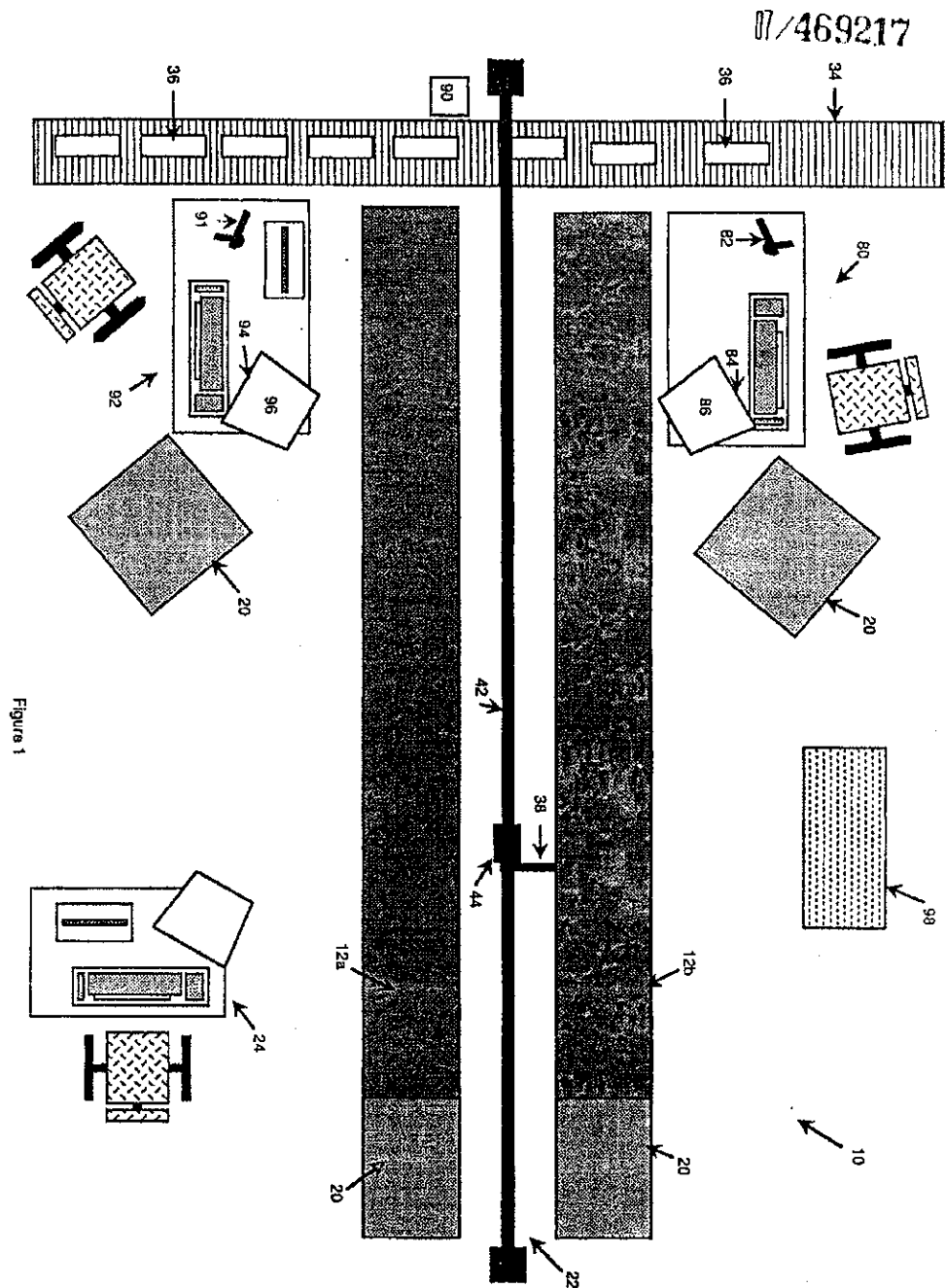
Full name of third joint inventor, if any James A. Smith
Inventor's signature *James A. Smith* 1/17/90
Date _____ Country of Citizenship United States
Residence 3909 Ash Drive, Allison Park, PA 15101
Post Office Address 3909 Ash Drive, Allison Park, PA 15101

Full name of fourth joint inventor, if any Gregory Toto
Inventor's signature *Gregory Toto* 1/17/90
Date _____ Country of Citizenship United States
Residence 110 Inglewood Drive, Pittsburgh, PA 15228
Post Office Address 110 Inglewood Drive, Pittsburgh, PA 15228

Full name of fifth joint inventor, if any _____
Inventor's signature _____
Date _____ Country of Citizenship _____
Residence _____
Post Office Address _____

(Added Page to Combined Declaration and Power of Attorney for Signature by Third and
Subsequent Inventors [1-2])

M0125335



Figures 1

07/469217

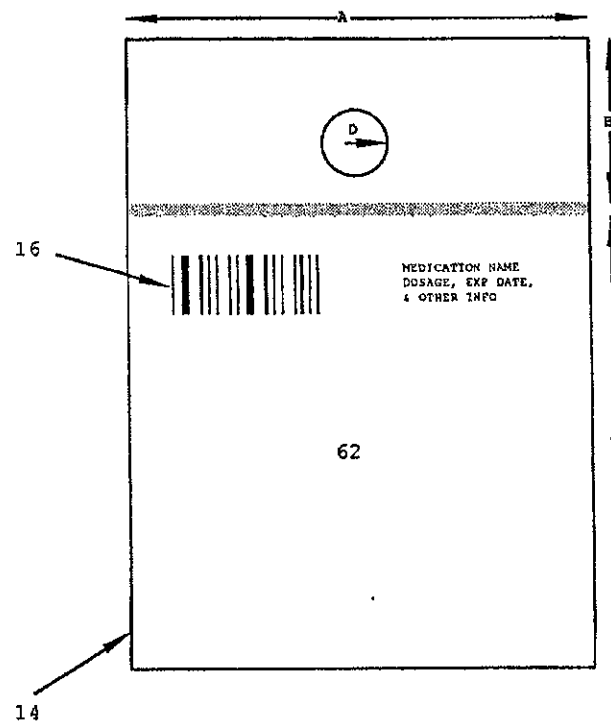


Figure 2

M0125337

07/469217

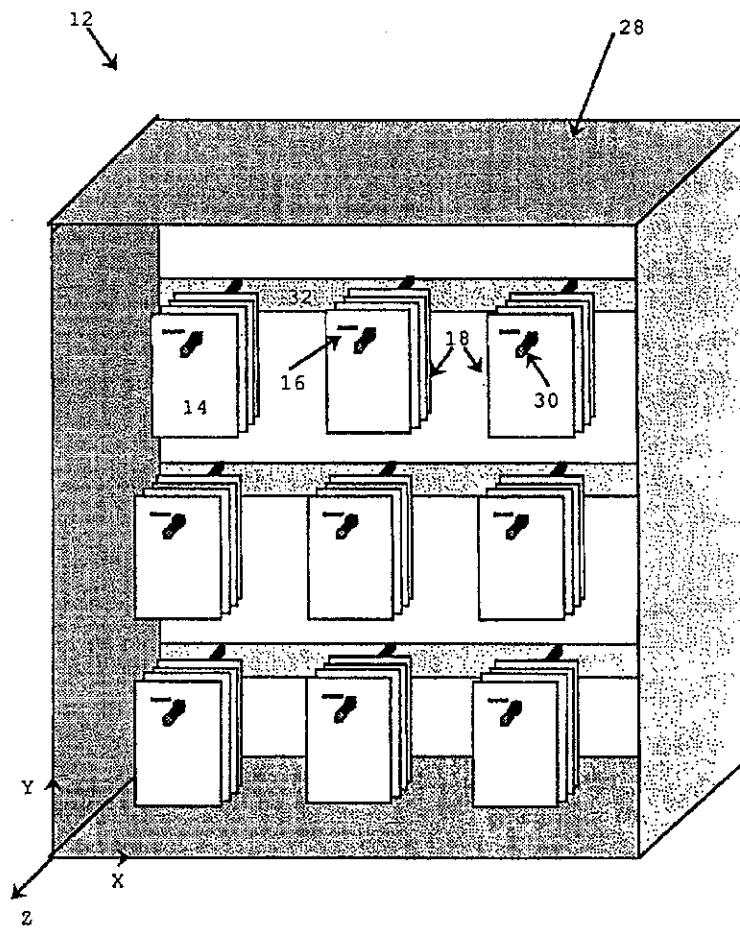
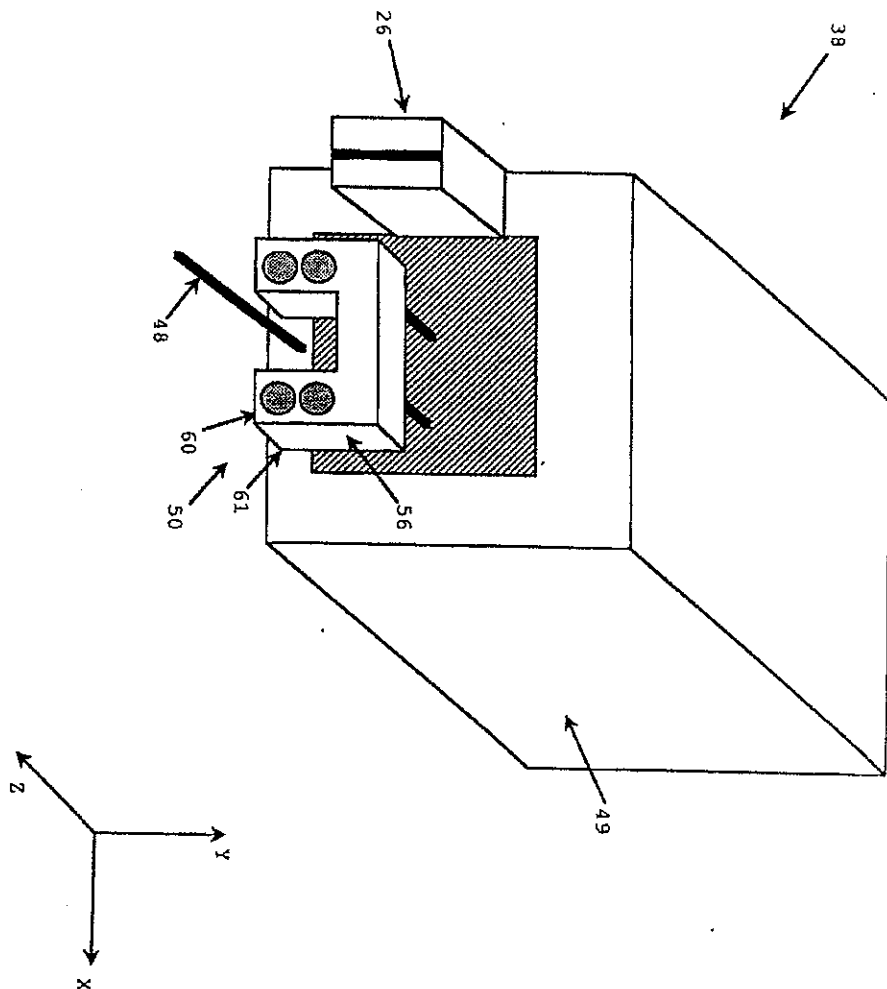


Figure 3

M0125338

07/469217

Figure 4a



07/469217

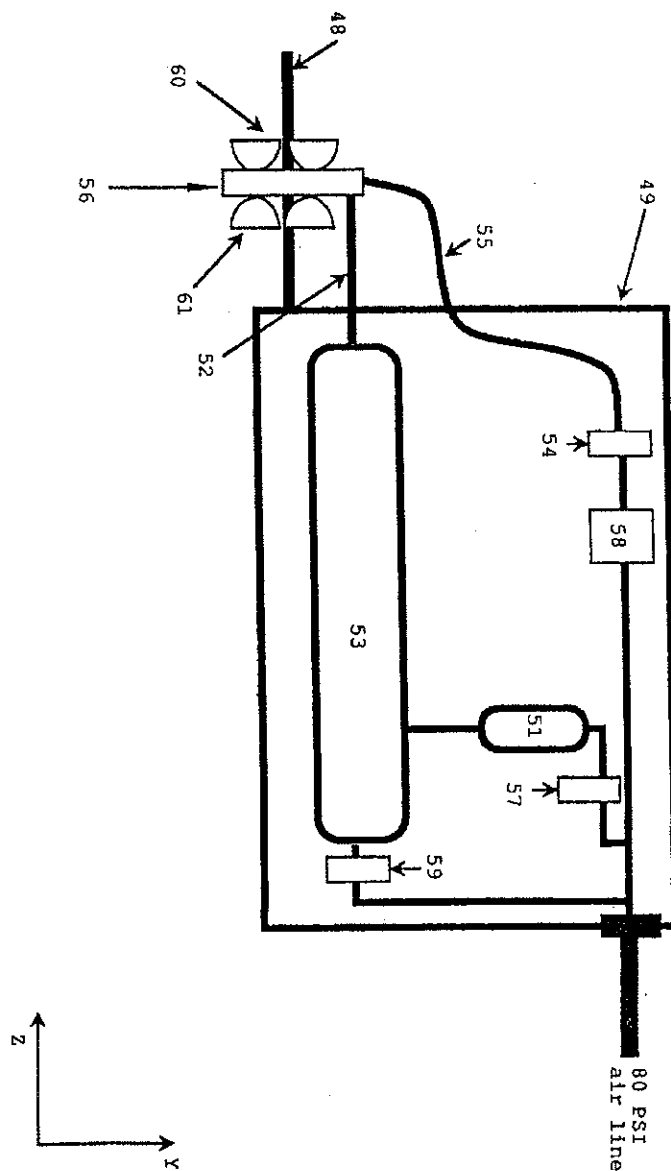


Figure 4b

M0125340

07/469217

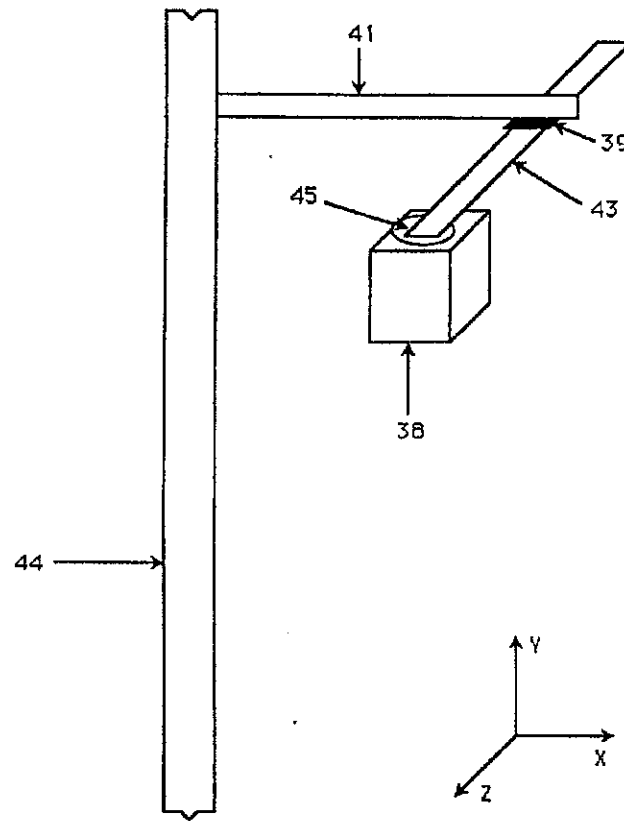


Figure 4c

11/469217

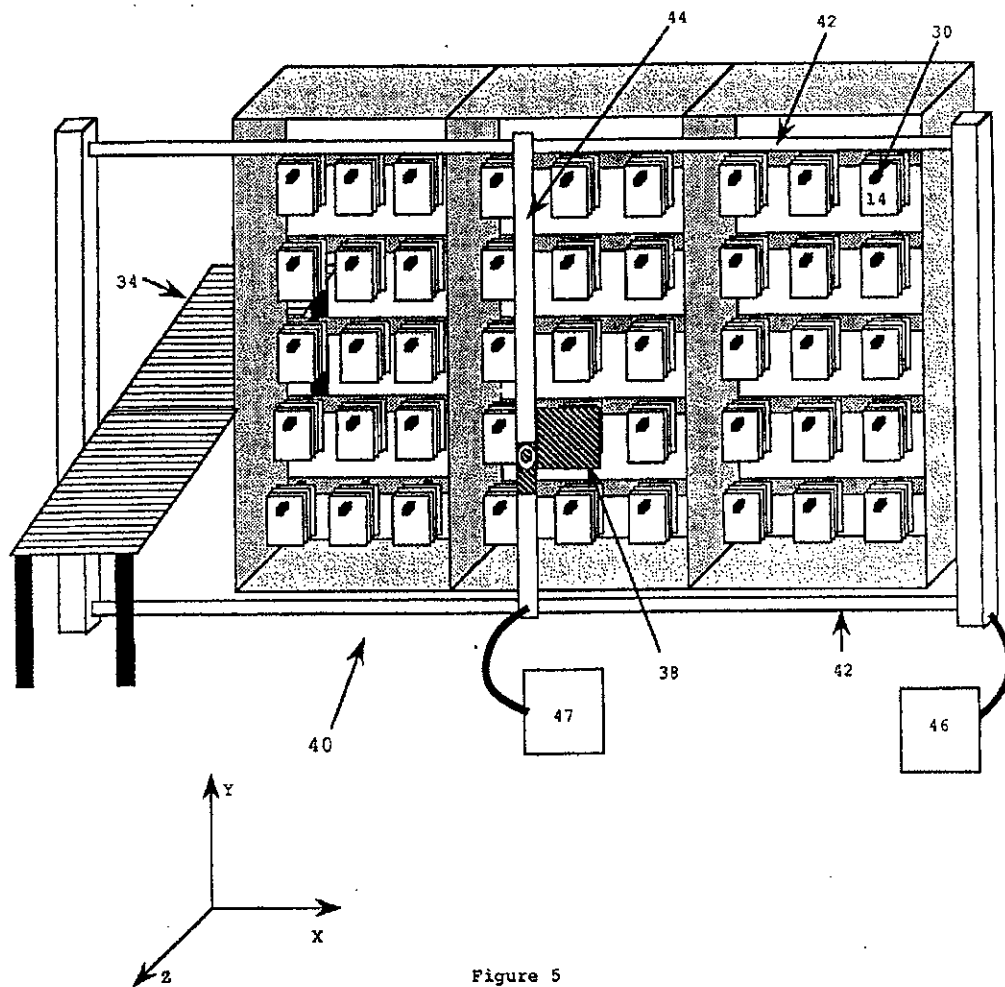


Figure 5

M0125342

07/469217

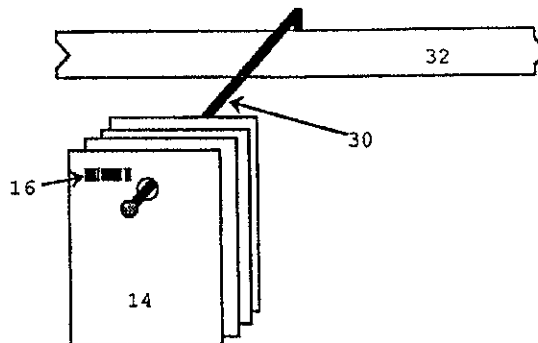


Figure 6A

07/469217

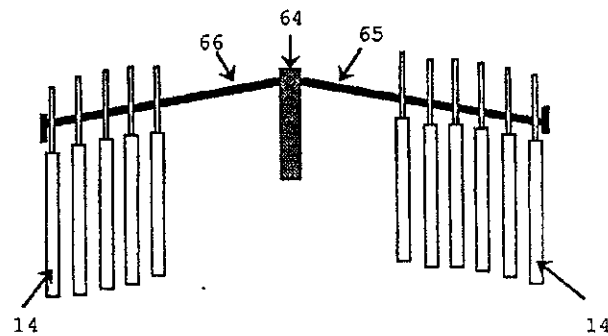
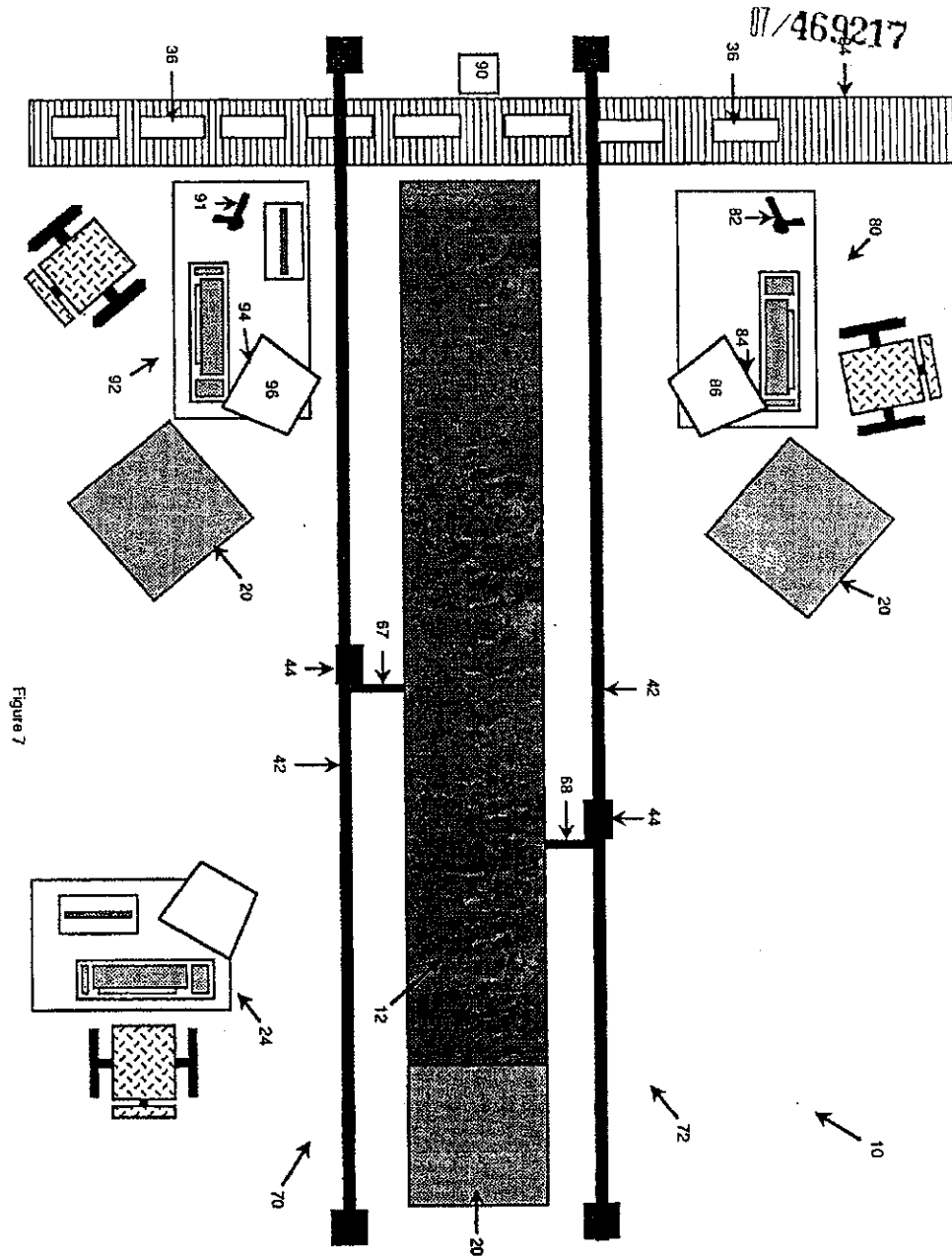


Figure 6B



PROCESS A PATIENT ORDER

07/469217

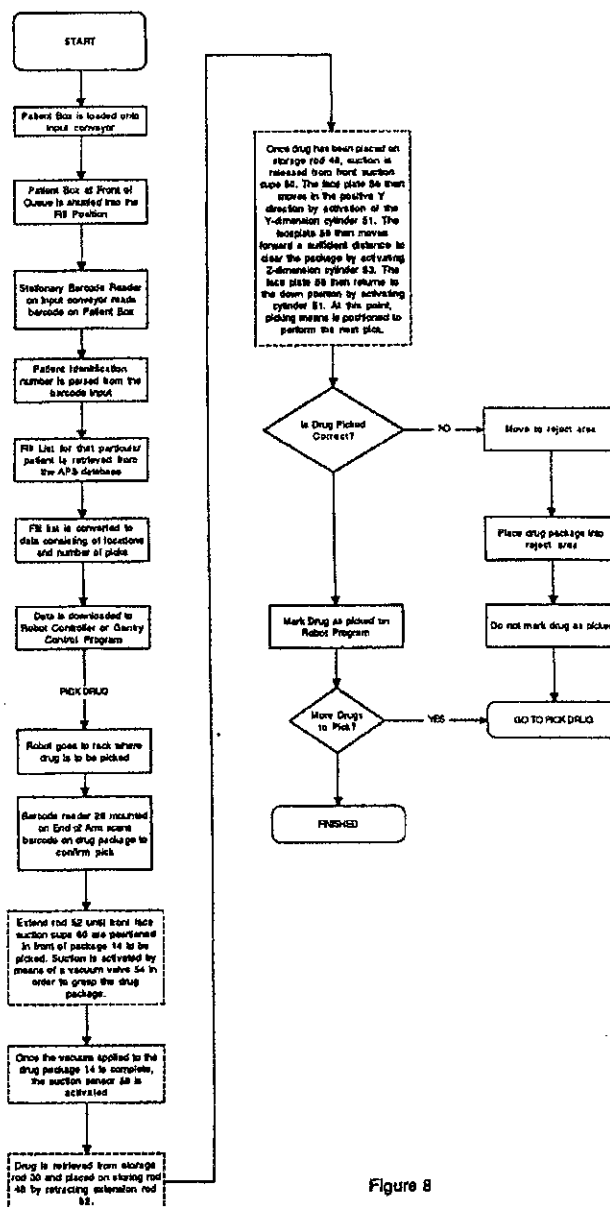


Figure 8

DETAILED CHECK STATION

07/469217

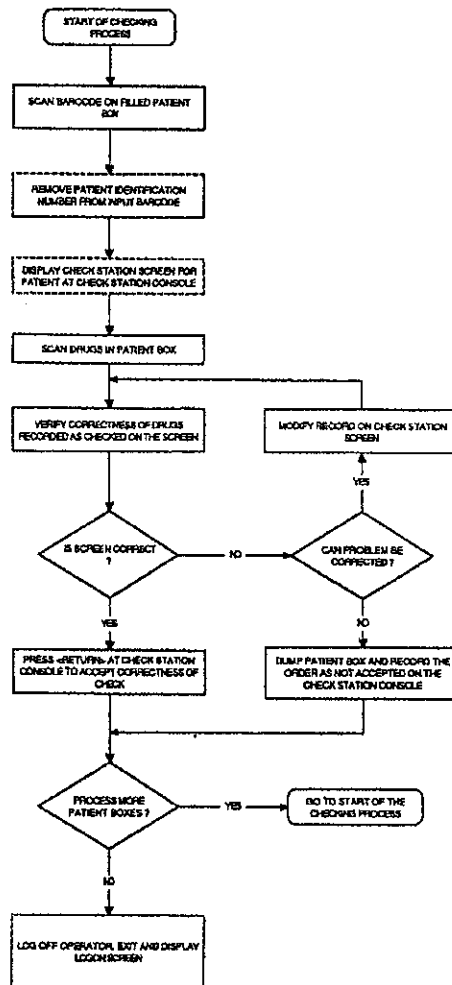


Figure 9

M0125347

DETAILED RETURN
STATION

17/469217

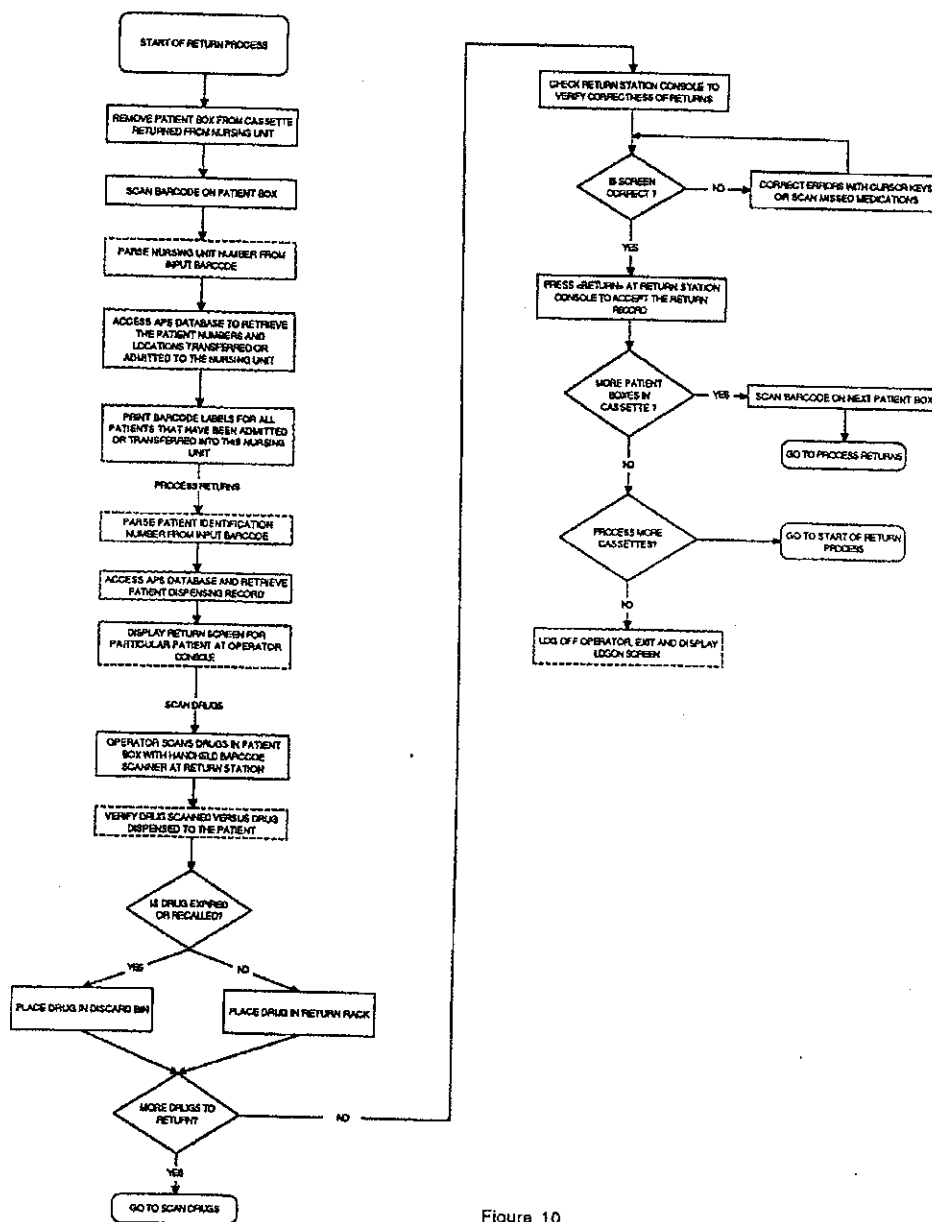


Figure 10

M0125348

DETAILED RETURN DRUGS TO BIN

07/469217

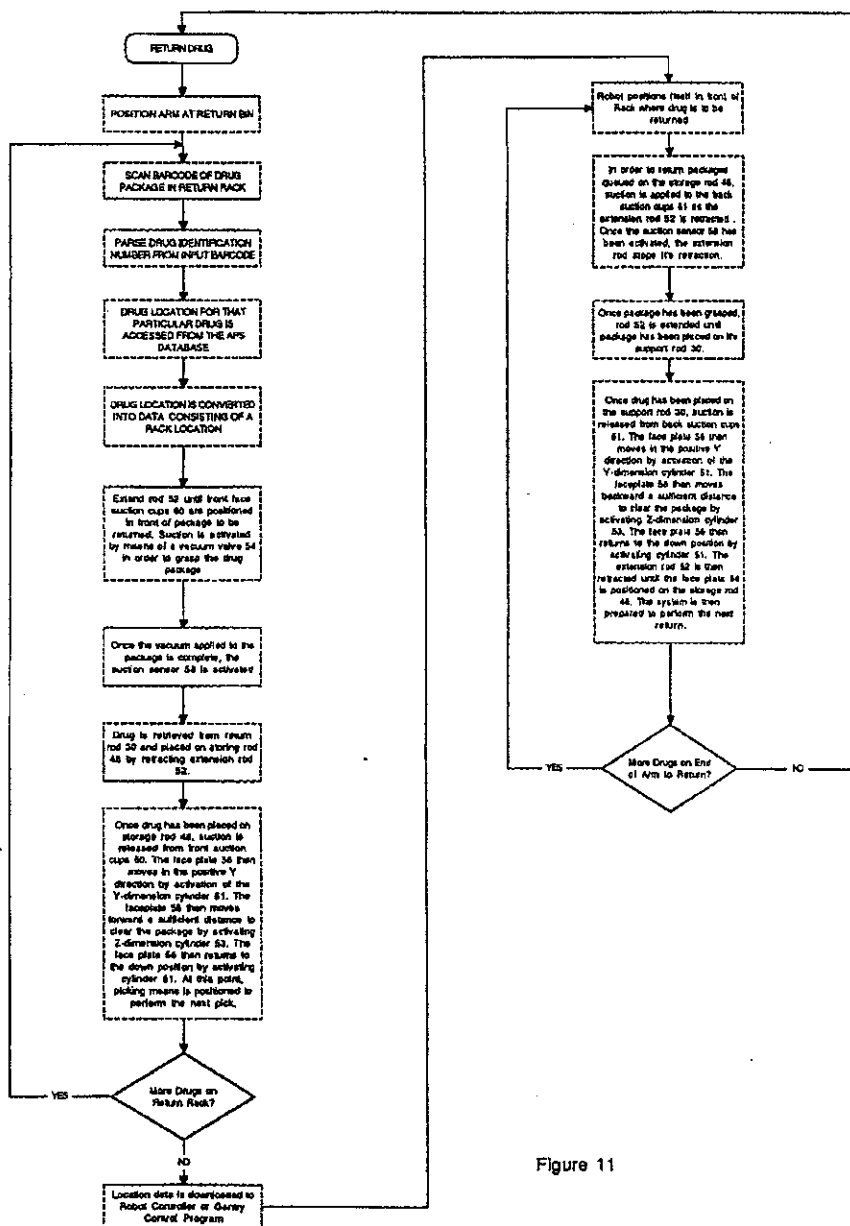


Figure 11

M0125349

Print Of Drawing
As Original Filed

07/469217

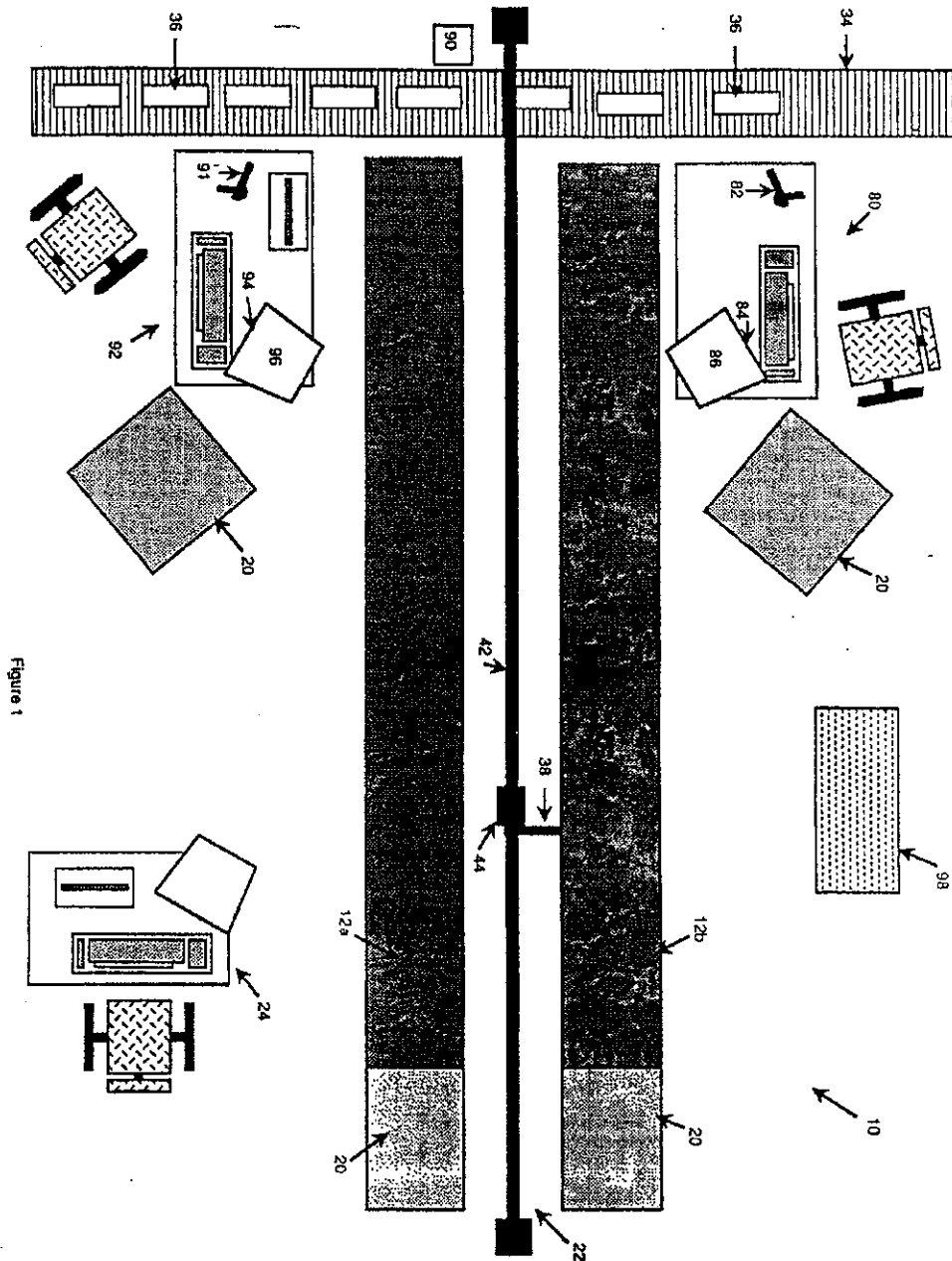


Figure 1

Print Of Drawing
As Original Filed

07/469217

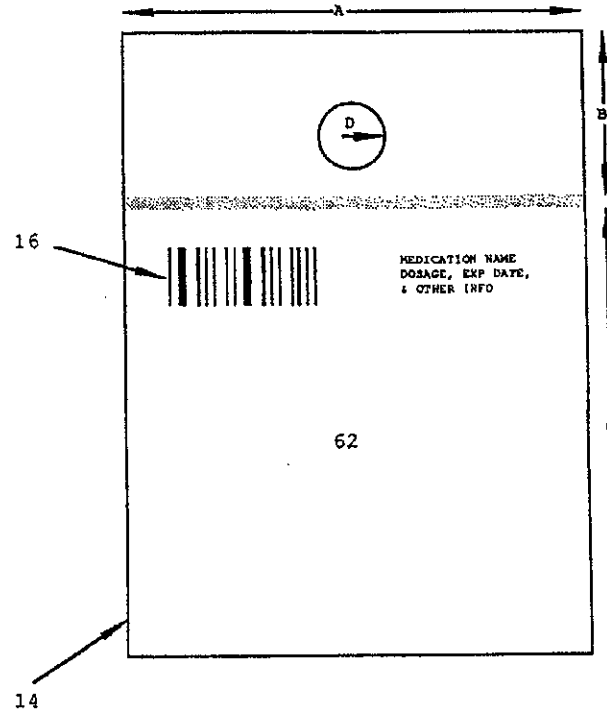


Figure 2

Print of Drawing
As Original Filed

07/469217

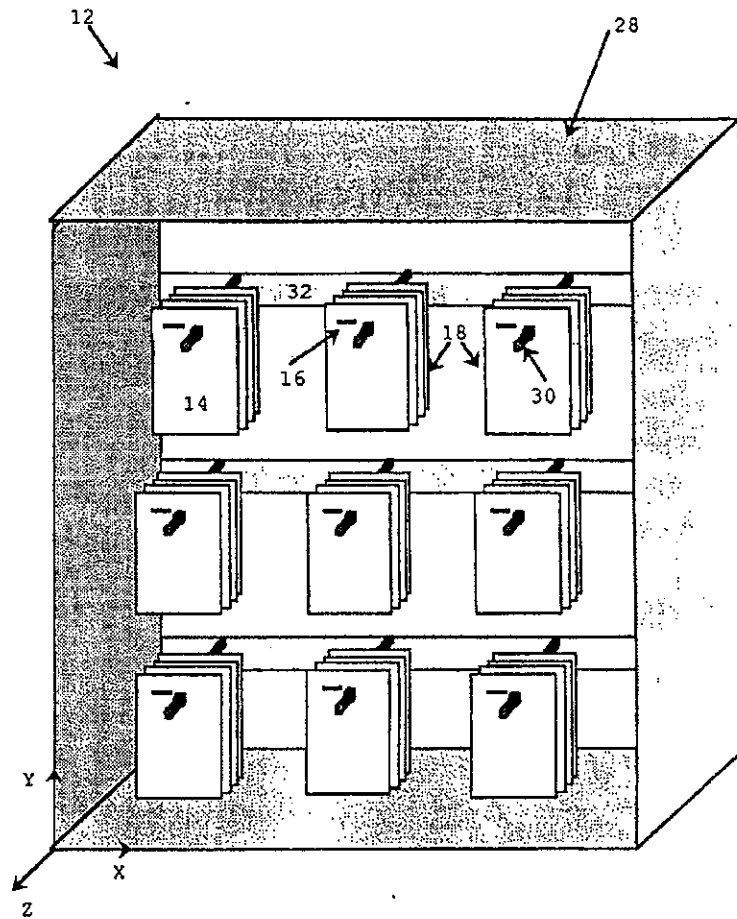
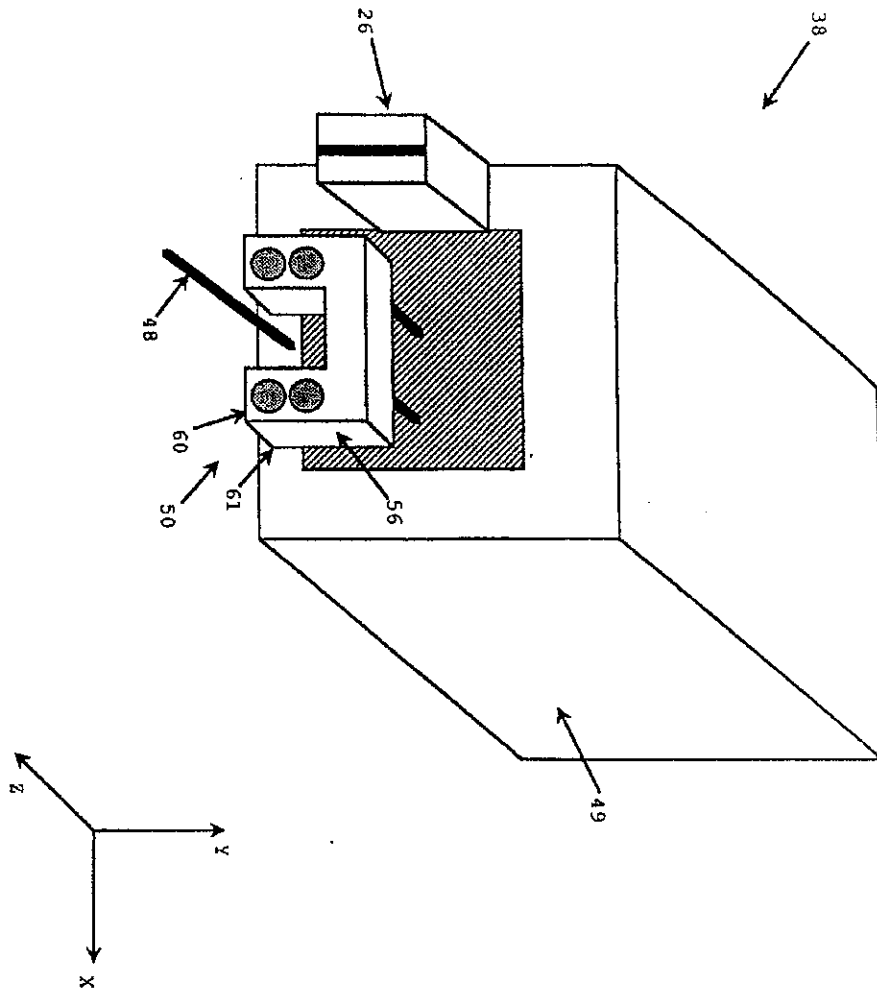


Figure 3

Print Of Drawing
As Original Filed

07/469217

Figure 4a



M0125353

Print Of Drawing
As Original Filed

07/469217

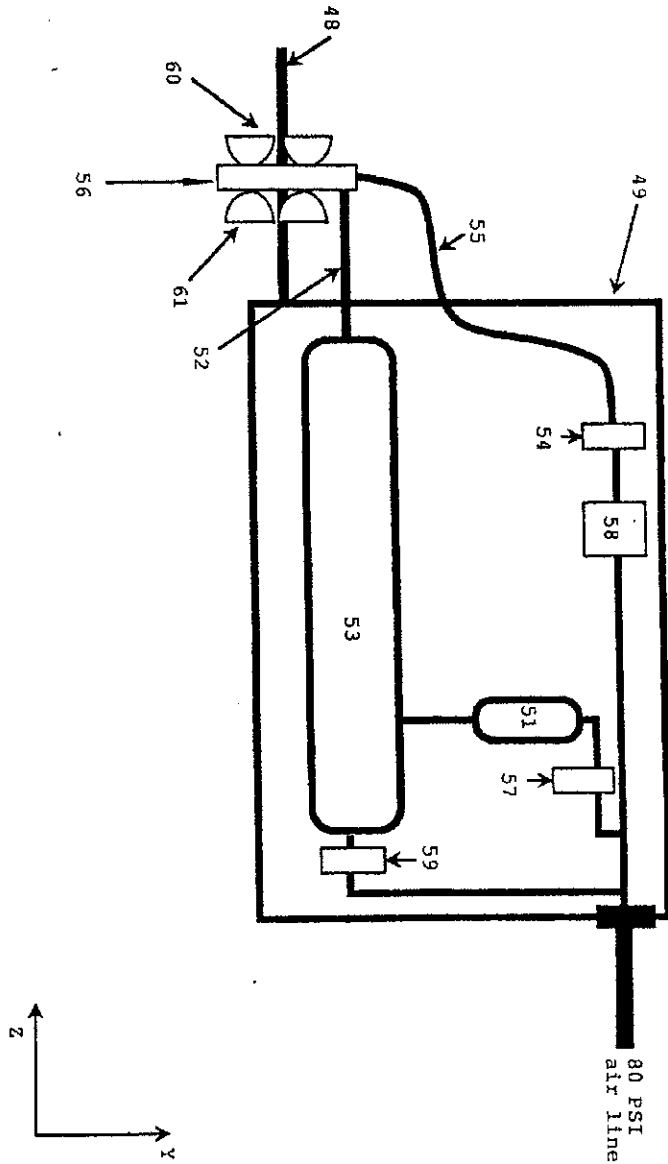


Figure 4b

M0125354

Print Of Drawing
As Original Filed

07/469217

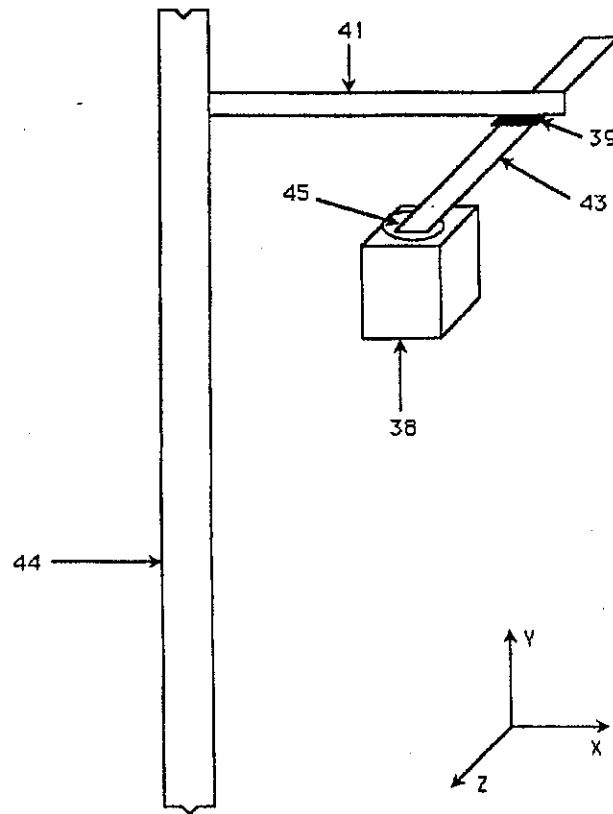
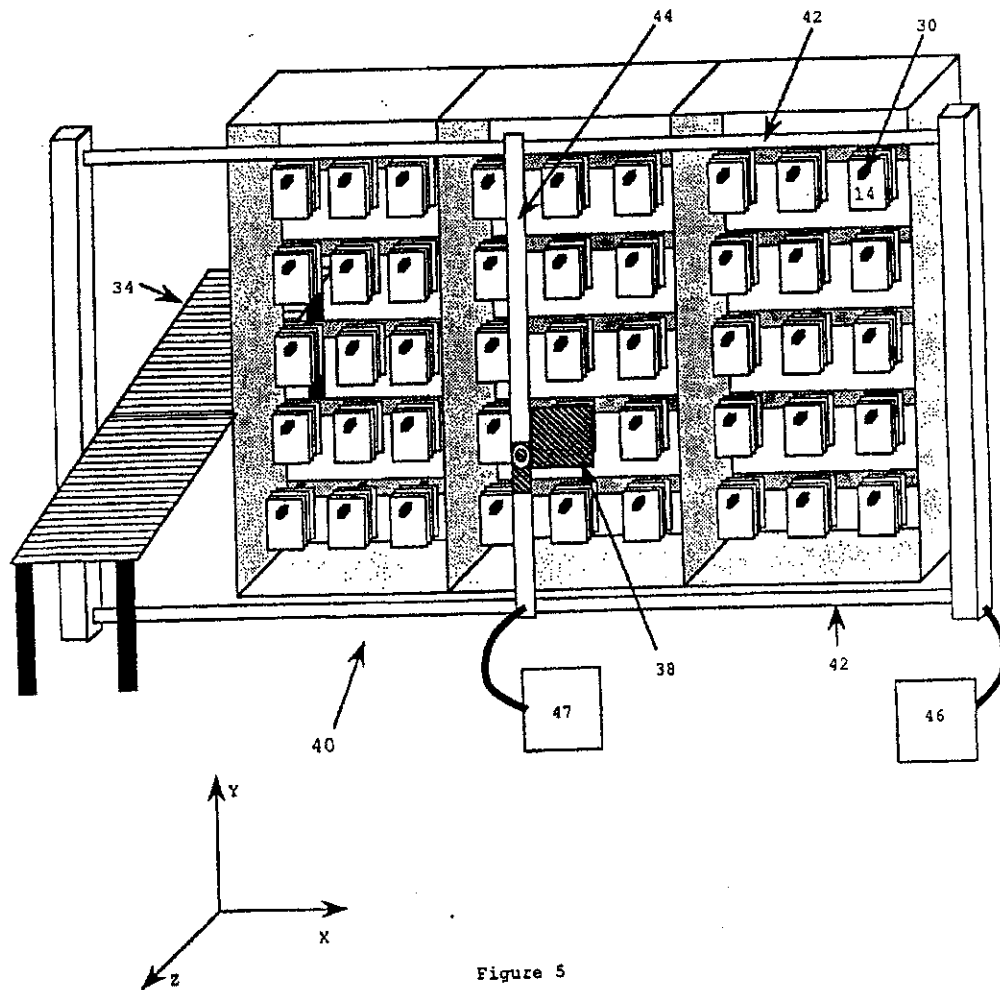


Figure 4c

M0125355

Print Of Drawing
As Original Filed

07/469217



M0125356

Print Of Drawing
As Original Filed

11/469217

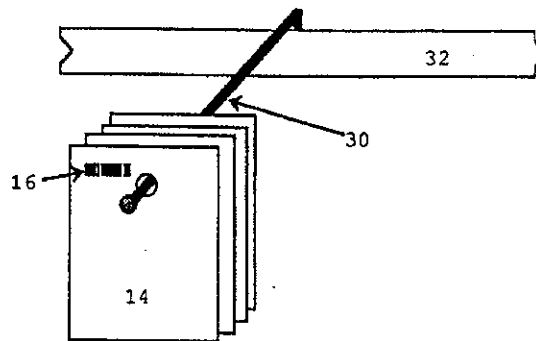


Figure 6A

Print Of Drawing
As Original Filed

07/469217

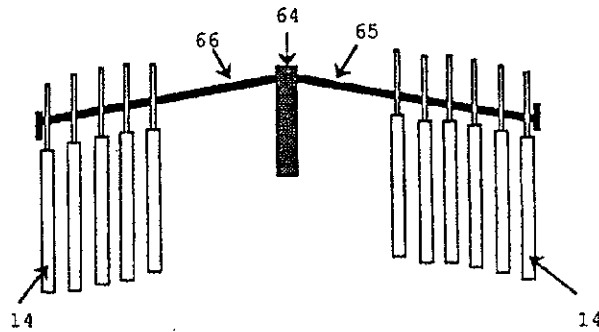


Figure 6B

M0125358

Print of Drawing
As Original Filed

07/469217

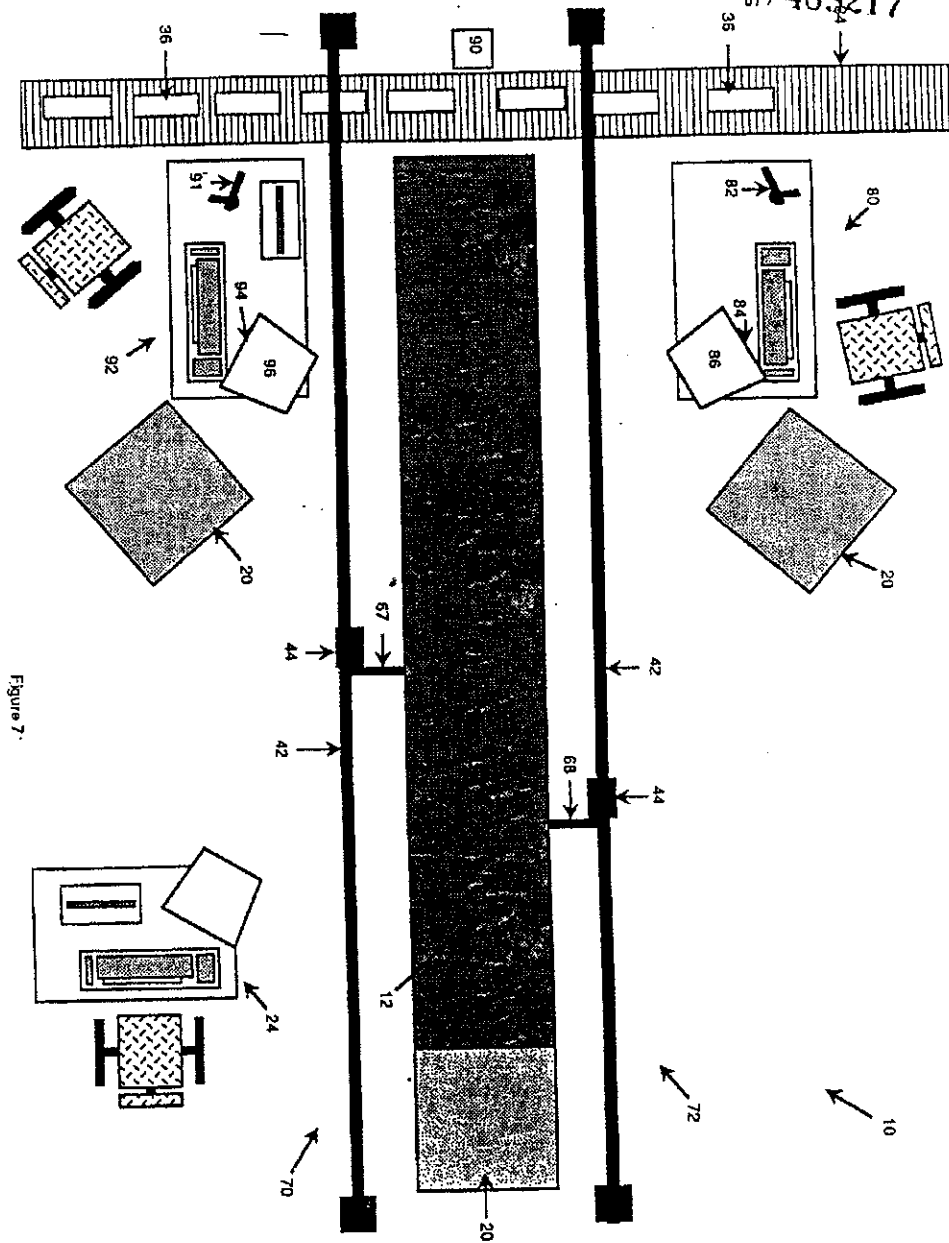


Figure 7.

Print of Drawing
As Original Filed

PROCESS A PATIENT ORDER

07/469217

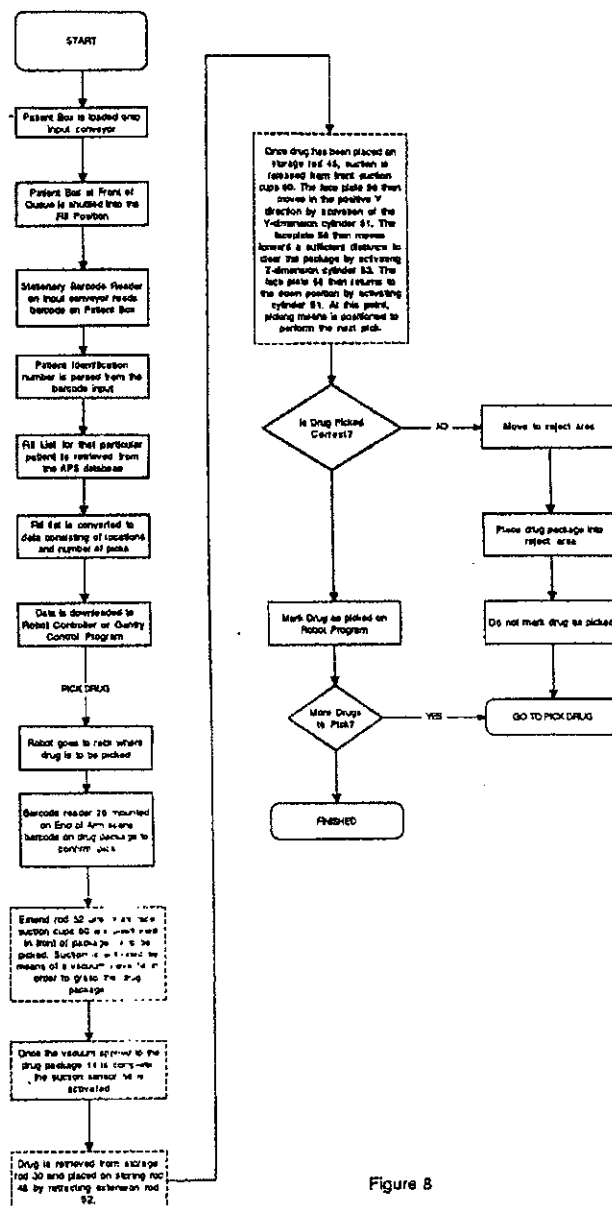


Figure 8

! Print .Of Drawing
As Original Filed

DETAILED CHECK STATION

07/469217

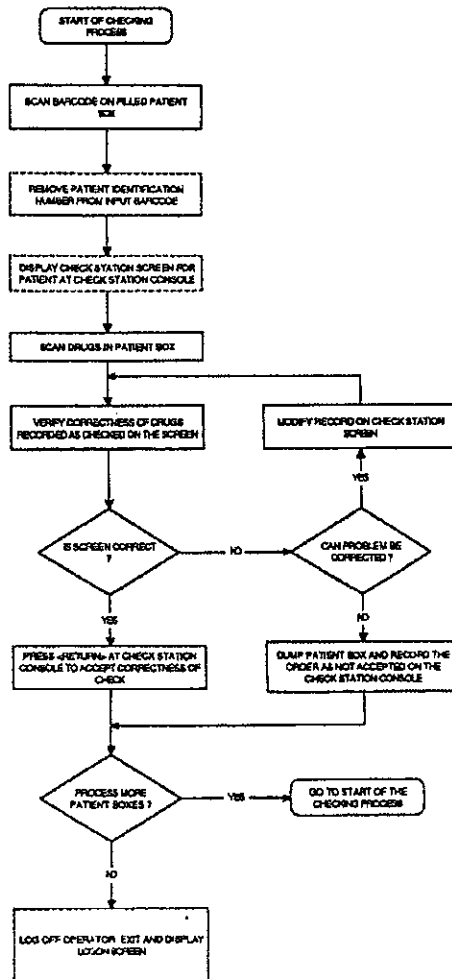


Figure 9

Print Of Drawing
As Original Filed

07/469217

STATION

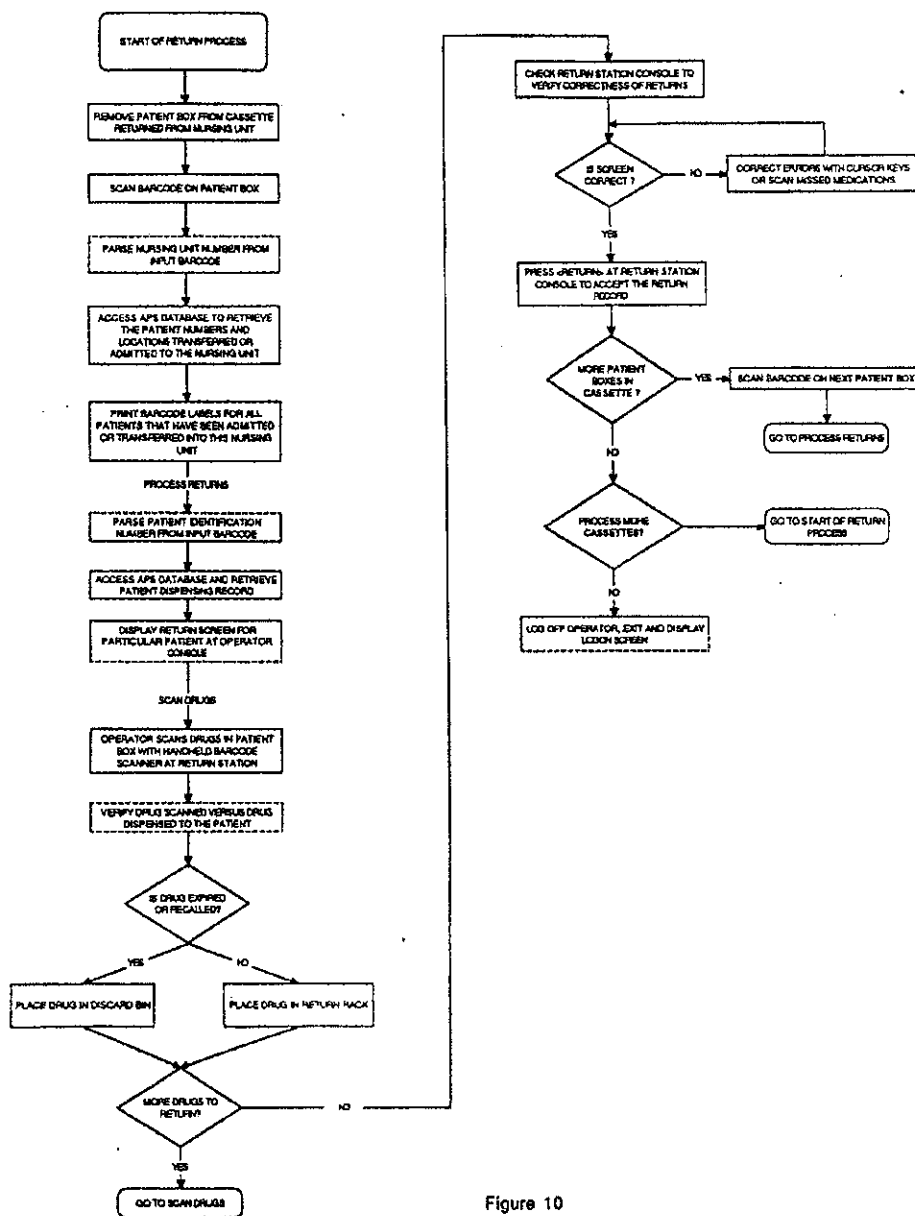


Figure 10

Print Of Drawing
As Original Filed
DETAILED RETURN DRUGS TO BIN

07/469217

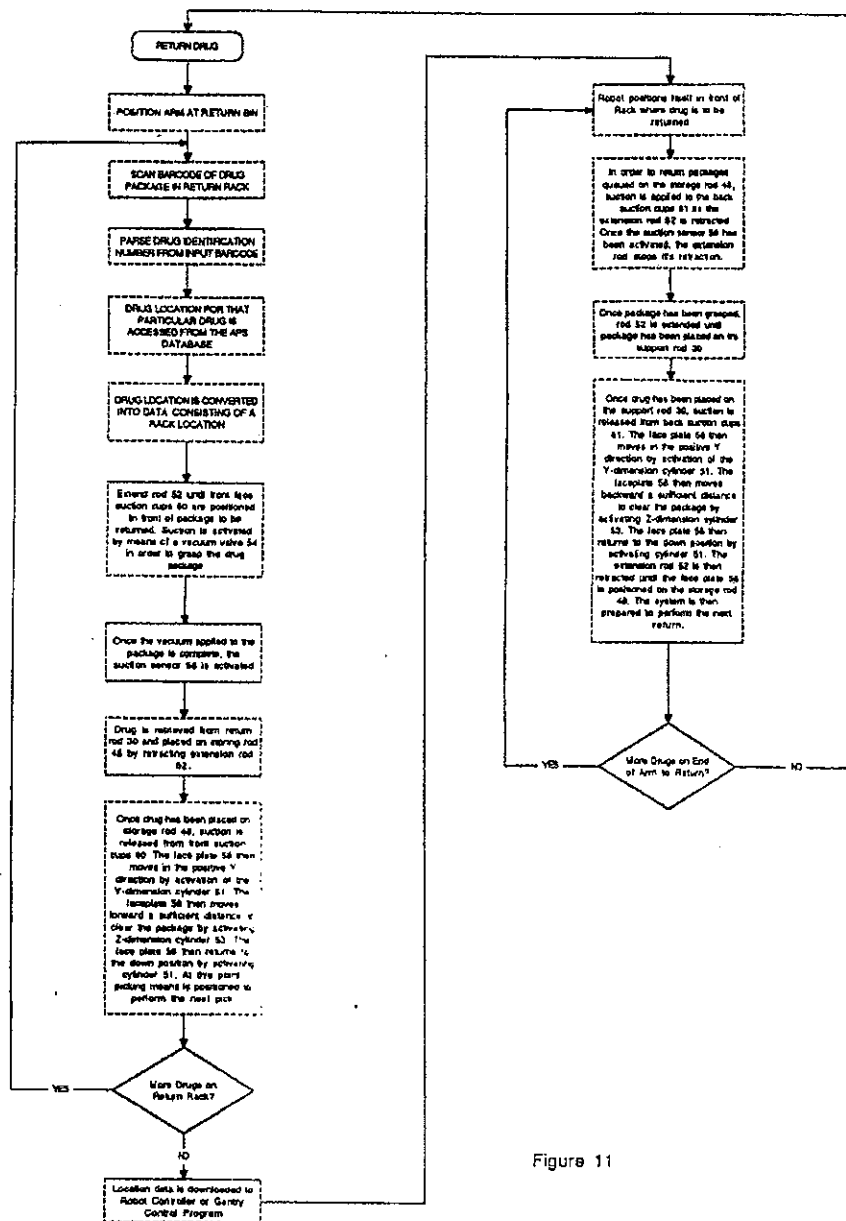


Figure 11


UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

 Address: COMMISSIONER OF PATENTS AND TRADEMARKS
 Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED INVENTOR	CLASS	FILED NUMBER
07/469,217	01/24/90	MC DONALD	8	1797003
ANSEL M. SCHWARTZ ALDER, COHEN AND GRIGSHY 625 LIBERTY AVE., PITTSBURGH, PA 15222			EXAMINER TRAMMELL, J APP. NO. 236 DATE MAILED 05/10/91	

 This is a communication from the Commissioner of Patents and Trademarks.
 COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☐ Responsive to communication filed on _____ ☐ This action is made final.

 A shortened statutory period for response to this action is set to expire 3 month(s), 0 days from the date of this letter.
 Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- | | |
|---|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited by Examiner, PTO-892. | 2. <input checked="" type="checkbox"/> Notice re Patent Drawing, PTO-948. |
| 3. <input type="checkbox"/> Notice of Art Cited by Applicant, PTO-1449. | 4. <input type="checkbox"/> Notice of Informal Patent Application, Form PTO-152 |
| 5. <input type="checkbox"/> Information on How to Effect Drawing Changes, PTO-1474. | 6. <input type="checkbox"/> _____ |

Part II SUMMARY OF ACTION

1. ☒ Claims 1-23 are pending in the application.
 Of the above, claims _____ are withdrawn from consideration.
2. ☐ Claims _____ have been cancelled.
3. ☐ Claims _____ are allowed.
4. ☒ Claims 1-5 and 18-20 and 23 are rejected.
5. ☒ Claims 6-17 and 21-22 are objected to.
6. ☐ Claims _____ are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice re Patent Drawing, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____, has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed _____, has been ☐ approved; ☐ disapproved (see explanation).
12. ☐ Acknowledgement is made of the claim for priority under U.S.C. 119. The certified copy has ☐ been received ☐ not been received
☐ been filed in parent application, serial no. _____; filed on _____.
13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

EXAMINER'S ACTION

PTO 028 (Rev. 9-89)

M0125364

Serial No. 469,217

-2-

- 1) The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
- 2) The drawings are objected to because the blank boxes in Figs 1-7 must be provided with description labels (Rule 1.83(a)).
Correction is required.

Applicant is required to submit a proposed drawing correction in response to this Office action. However, correction of the noted defect can be deferred until the application is allowed by the examiner.

- 3) The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, 18-19 and 20 are rejected under 35 U.S.C. § 102(b) as being anticipated by Modery et al. (4766547).

As per claims 1-5 and 18-19, any conventional automatic storage and retrieval system with diverse application comprises: means for holding container, (or packages) each container having the same type of contents being held at a predetermined location by the holding means, said holding means having a plurality of predetermined locations corresponding to a plurality of different types of contents; means for supplying

M0125365

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-3-

containers to the holding means; and means for picking a container from the holding means that is identified in a order, or from the supplying means for the purpose of restocking the holding means, said picking means in communication with the holding means and supplying means, a computer having a database having a order to be filled; said computer guiding said picking means with said database such that the picking means picks a container according to the order to be filled and the picking means including means for determining the identity of a container and restocking the identified container according to its contains and its predetermined location in the holding means. For example Modery et al. shows this kind of automatic storage and retrieval system that meets all the claimed features, see Fig 1. The intended use for filling medicine prescriptions with a conventional automatic storage and retrieval system is held not to distinguish from prior art.

As per claim 20, Modery meets these claimed features, see Fig 1 item 20.

4) Claims 2-5 are rejected under 35 U.S.C. § 103 as being unpatentable over Modery et al. (47665471).

As per claims 2-5, Modery shows a conventional automatic storage and retrieval system as applied in the 102 rejection.

Modery et al. does not expressly state that this type of

Serial No. 469,217

-4-

conventional automatic storage and retrieval system can be use for packing of medicine.

Because of the well known diverse application of conventional automatic storage and retrieval systems it would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize just a system for fillings prescriptions for patients, thus obtaining all the features in claims 2-5.

5) The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 23 is rejected under 35 U.S.C. § 102(b) as being anticipated by Chucta (4669047).

As per claim 23, Chucta shows: A housing; means for storing packages or containers attached to the housing; means for obtaining a package, said obtaining means sidlingly attached to the housing such that it can move to pick a package from a support rod in a support structure when the housing is adjacent to and aligned with a support rod, and then move to place a picked package on the storing means; and means for identifying a package to be obtained by the obtaining means, said identifying means connected to the housing, see Fig. 7.

Serial No. 469,217

-5-

6) Claims 6-17 and 21-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7) The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jim Trammell whose telephone number is (703) 1066.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 0754.

JTT
TRAMMELL:mrt
May 01, 1991

Jerry Smith
JERRY SMITH
SUPERVISORY PATENT EXAMINER
ART UNIT 236

M0125368

TO SEPARATE, HOLD TOP AND BOTTOM EDGES, SNAP-APART AND DISCARD CARBON

JW

FORM PTO-892 (REV. 3-78)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		SERIAL NO. 07/469217	GROUP ART UNIT 236	ATTACHMENT TO PAPER NUMBER 2		
NOTICE OF REFERENCES CITED				APPLICANT(S) Sean C. Mc Donald et al.				
U.S. PATENT DOCUMENTS								
#	DOCUMENT NO.	DATE	NAME	CLASS	SUB-CLASS	FILING DATE IF APPROPRIATE		
A	4792270	12/20/88	Tachida	364	478			
B	4786229	11/21/88	Henderson	364	478			
C	4733362	3/22/88	Hanaguchi	364	479			
D	4847764	7/11/89	Halvorsen	364	479			
E	4826024	1/23/90	Mercib et al.	235	361	10/19/87		
F	4766547	8/23/88	Modery et al.	364	478			
G	4669047	5/26/87	Chveta	364	478			
H								
I								
J								
K								
FOREIGN PATENT DOCUMENTS								
#	DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUB-CLASS	PERTINENT SHTS. DWG	PP. SPEC.
L								
M								
N								
O								
P								
Q								
OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)								
R								
S								
T								
U								
EXAMINER Jim Trammell		DATE 4/17/91						
* A copy of this reference is not being furnished with this office action. (See Manual of Patent Examining Procedure, section 707.05 (a).)								

M0125369

PTO - 848
(Rev. 8-82)U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

ATTACHMENT TO PAPER NUMBER	2
S.N.	469217

GROUP 236

NOTICE OF PATENT DRAWINGS OBJECTION

Drawing Corrections and/or new drawings may only be submitted in the manner set forth in the attached letter, "Information on How to Effect Drawing Changes" PTO-1474.

- A. ☒ The drawings, filed on 1/24/90, are objected to as informal for reason(s) checked below:

- | | |
|--|---|
| 1. <input type="checkbox"/> Lines Pale. | 11. <input type="checkbox"/> Parts in Section Must Be Hatched. |
| 2. <input type="checkbox"/> Paper Poor. | 12. <input checked="" type="checkbox"/> Solid Black Objectionable.
<i>Fig 1, 3, 4A, 5-7</i> |
| 3. <input type="checkbox"/> Numerals Poor. | 13. <input type="checkbox"/> Figure Legends Placed Incorrectly. |
| 4. <input type="checkbox"/> Lines Rough and Blurred. | 14. <input type="checkbox"/> Mounted Photographs. |
| 5. <input type="checkbox"/> Shade Lines Required. | 15. <input type="checkbox"/> Extraneous Matter Objectionable.
[37 CFR 1.84 (1)] |
| 6. <input type="checkbox"/> Figures Must be Numbered. | 16. <input checked="" type="checkbox"/> Paper Undersized; either 8 1/2" x 14",
or 21.0 cm. x 29.7 cm. required.
<i>(Fig 1-11)</i> |
| 7. <input type="checkbox"/> Heading Space Required. | 17. <input checked="" type="checkbox"/> Proper A4 Margins Required:
<input type="checkbox"/> TOP 2.5 cm. <input type="checkbox"/> RIGHT 1.5 cm.
<input type="checkbox"/> LEFT 2.5 cm. <input type="checkbox"/> BOTTOM 1.0 cm. |
| 8. <input type="checkbox"/> Figures Must Not be Connected. | 18. <input checked="" type="checkbox"/> Other: |
| 9. <input type="checkbox"/> Criss-Cross Hatching Objectionable. | |
| 10. <input type="checkbox"/> Double-Line Hatching Objectionable. | |

- Fig legends small; must be larger (*Fig 1-11*)

- Half-tone stippling dig (*Fig 1, 3, 4A, 5, 6B, 7*)
- Character small; must be at least 1/8" tall (*Fig 1-11*)

- B. ☒ The drawings, submitted on 1/24/90, are so informal they cannot be corrected. New drawings are required. Submission of the new drawings MUST be made in accordance with the attached letter.

M0125370

360-00217CP236

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Steven McDonald et al.

Group No.: 236

Serial No. 07/469,217

Examiner: J. Trammell

Filed: SYSTEM FOR FILLING ORDERS

For:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

NOV 13 1991

ORIGINAL

PETITION AND FEE FOR EXTENSION OF TIME (37 CFR 1.136(a))

1. This is a petition for an extension of time for a total period of three months:
(check and complete the applicable item below)

(X) to respond to the Office Letter mailed on May 10, 1991
() for _____

(indicate matter being extended)

2. A response in connection with the matter for which this extension is requested:

(X) is filed herewith.
() has been filed.

3. Applicant is

(X) a small entity -- verified statement:

() attached.
(X) already filed.

() other than a small entity.

4. Calculation of extension fee

	Total months requested	Fee for other than small entity	Fee for small entity
()	one month	\$ 100.00	\$ 50.00
()	two months	\$ 300.00	\$ 150.00
(X)	three months	\$ 730.00	\$ 365.00
()	four months	\$ 1150.00	\$ 575.00
		Fee \$	

CERTIFICATE OF MAILING (37 CFR 1.8a)

I hereby certify that this paper (along with any referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to the: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

070 AA 11/13/91 07469217

Ange Bezel CK

Date: November 1, 1991

(Signature of person mailing paper)

(Petition and Fee for Extension of Time (37 CFR 1.136(a)) [11-2]-page 1 of 2)

M0125371

(check and complete the next item, if applicable)

() An extension for _____ has already been secured and the fee paid therefore of \$ _____ is deducted from the total fee due for the total months of extension now requested.


Extension fee due with this request \$ _____

5. Fee Payment

(X) Attached is a check in the sum of \$ 365.00
() Charge fee to Account No. 02-4553 and for any additional extension fee required or credit for any excess fee paid. A duplicate of this petition is attached.

Reg. No.: 29,362

Tel. No.: 412-562-1632


Lynn J. Alstadt
Buchanan Ingersoll Professional Corporation
56th Floor, 600 Grant Street
Pittsburgh, Pennsylvania 15219



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit 236 : PATENT APPLICATION
Examiner J. Trammell :
In re application of :
SEAN McDONALD et al. : SYSTEM FOR FILLING ORDERS
Serial No. 07/469,217 :
Filed January 24, 1990 :

4/a
11/20/91
unc

A M E N D M E N T

Pittsburgh, Pennsylvania 15219

November 1, 1991

Hon. Commissioner of Patents and Trademarks

Washington, D.C. 20231

Sir:

Change the title of this application from "A System for
Filling Orders" to -- System for Selecting and Delivering
Packages from a Holding Area to Fill Orders --.

Cancel claims 1 to 5, 18 to 21 and 23.

Amend the claims as follows:

1. (Amended) A system [as described in claim 5] for
selecting and delivering packages from a holding means or supply
means to fill orders comprising:

M0125373

- a1
- a. [wherein the] holding means [includes a structure;
and] comprised of a frame having a plurality of
support rods [held by the structure, said rods] for
holding [the] medicine packages, each rod
associated with a given medicine and holding
medicine packages with only the same medicine[.]
 - b. means for supplying medicine packages to the
support rods;
 - c. means for picking medicine packages from the
support rods in accordance with instructions
received from a computer, said picking means being
able to access the holding means and the supply
means;
 - d. a computer having a database containing the
locations of all packages in the holding means able
to receive orders for packages and able to direct
the means for picking packages.
-

In claim 7, line 2, change "structure" to -- holding
means --.

In claim 22, line 1, change "claim 21" to -- claim 6 --.

REMARKS

This is in response to the Office Action dated May 10, 1991. A Power of Attorney and Request for Extension of Time are filed herewith. Applicants understand that previous counsel has submitted the appropriate request and fees for a two month extension of time. For that reason, only the third month extension fee is submitted by check. Should the fee not have been received for the first two months or should additional fees be due, the Examiner is authorized to charge those fees to Deposit Account No. 02-4553.

In the Office Action the Examiner objected to the title and the drawings, rejected claims 1 to 5, 18 to 20 and 23 and objected to the remaining claims. By this amendment applicants have provided a more specific title, cancelled the rejected claims and claim 21 and have rewritten the objectionable claims. Applicants respectfully request that a response to the drawing objection be deferred until claims have been allowed.

Claim 6 has been written in independent form. The Examiner stated that claim 6 would be allowable if rewritten. Claims 7 thru 17 and 22 depend from allowable claim 6 and are, therefore, allowable. Since all pending claims are allowable,

reconsideration of the claims and issuance of a Notice of Allowance are respectfully requested.

Respectfully submitted,
BUCHANAN INGERSOLL, P.C.

BY *Lynn J. Alstadt*
Lynn J. Alstadt
Registration No. 29,362
Attorneys for Applicants

(412) 562-1632

I hereby certify that this correspondence is being deposited
with the United States Postal Service as first class mail in a
manila envelope addressed to: The Commissioner of Patents and
Trademarks, Washington, D.C. 20231 on 11-1-91

Angie Keyer
Signature
November 1, 1991
Date of Signature



NO. RM PTO-1083

Case Docket No.: 910517

Re application of: Sean McDonald et al.Serial No.: 07/469,217Filed: January 24, 1990FOR: SYSTEM FOR FILING ORDERS

THE COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, DC 20231

Sir:

Transmitted herewith is an amendment in the above-identified application.

- ☒ Small entity status of this application under 37 CFR 1.9 and 1.27 has been established by a verified statement previously submitted.
- ☐ A verified statement to establish small entity status under 37 CFR 1.9 and 1.27 is enclosed.
- ☒ No additional fee is required.

The fee has been calculated as shown below:

	(Col. 1)		(Col. 2)		SMALL ENTITY			OTHER THAN A SMALL ENTITY	
	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NO. PREVIOUSLY PAID FOR	PRESENT EXTRA	ADDIT. RATE	ADDIT. FEE	OR	RATE	FEE
Total	10	MINUS	23	--	x 10 =	\$	OR	x 20 =	\$
Indep	1	MINUS	6	--	x 30 =	\$	OR	x 60 =	\$
FIRST PRESENTATION OF MULTIPLE DEP. CLAIM					+ 100 =	\$	OR	+ 200 =	\$
					TOTAL ADDIT. FEE	\$ --	OR	TOTAL	\$

- * If entry in Col. 1 is less than entry in Col. 2, write "0" in Col. 3.
- ** If the "Highest No. Previously Paid For" IN THIS SPACE is less than 20, write "20" in this space.
- *** If the "Highest No. Previously Paid For" IN THIS SPACE is less than 3, write "3" in this space.

- ☐ Please charge by Deposit Account No. 02-4553 the amount of \$ _____. A duplicate copy of this sheet is attached.
- ☐ A check in the amount of \$ _____ is attached.
- ☒ The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 02-4553. A duplicate copy of this sheet is attached.
- ☒ Any filing fees required under 37 CFR 1.16 for the presentation of extra claims.
- ☐ Any patent application processing fees under 37 CFR 1.17.

Respectfully submitted,

Registration No.

RICHARD M. WINGERSOLL PROFESSIONAL CORPORATION

(412) 562-163 2

LJA/bem

M0125377



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
---------------	-------------	-----------------------	---------------------

07/469,217 01/24/90 MC DONALD

6 1797003

EXAMINER

TRAMMELL, J

ART UNIT

PAPER NUMBER

2306

5

DATE MAILED: 01/23/92

ANSEL M. SCHWARTZ
ALDER, COHEN AND BRIGSHY
625 LIBERTY AVE.,
PITTSBURGH, PA 15222

NOTICE OF ALLOWABILITY

PART I

1. ☒ This communication is responsive to amendment A filed 11/4/91
2. ☒ All the claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice Of Allowance And Issue Fee Due or other appropriate communication will be sent in due course.
3. ☒ The allowed claims are 6-17 and 22, (claims 1 to 5, 18 to 21 and 23 have been cancelled)
4. ☐ The drawings filed on _____ are acceptable.
5. ☐ Acknowledgment is made of the claim for priority under 35 U.S.C. 119. The certified copy has [...] been received. [...] not been received. [...] been filed in parent application Serial No. _____, filed on _____.
6. ☐ Note the attached Examiner's Amendment.
7. ☐ Note the attached Examiner Interview Summary Record, PTOL-413.
8. ☐ Note the attached Examiner's Statement of Reasons for Allowance.
9. ☒ Note the attached NOTICE OF REFERENCES CITED, PTO-892.
10. ☐ Note the attached INFORMATION DISCLOSURE CITATION, PTO-1449.

PART II

A SHORTENED STATUTORY PERIOD FOR RESPONSE to comply with the requirements noted below is set to EXPIRE THREE MONTHS FROM THE "DATE MAILED" indicated on this form. Failure to timely comply will result in the ABANDONMENT of this application. Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

1. ☐ Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION, PTO-152, which discloses that the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.
2. ☒ APPLICANT MUST MAKE THE DRAWING CHANGES INDICATED BELOW IN THE MANNER SET FORTH ON THE REVERSE SIDE OF THIS PAPER.
 - a. ☒ Drawing informalities are indicated on the NOTICE RE PATENT DRAWINGS, PTO-948, attached hereto or to Paper No. 2. CORRECTION IS REQUIRED.
 - b. ☐ The proposed drawing correction filed on _____ has been approved by the examiner. CORRECTION IS REQUIRED.
 - c. ☒ Approved drawing corrections are described by the examiner in Para No. 2, Para 2 of the attached EXAMINER'S AMENDMENT. CORRECTION IS REQUIRED.
 - d. ☒ Formal drawings are now REQUIRED.

Any response to this letter should include in the upper right hand corner, the following information from the NOTICE OF ALLOWANCE AND ISSUE FEE DUE: ISSUE BATCH NUMBER, DATE OF THE NOTICE OF ALLOWANCE, AND SERIAL NUMBER.

Attachments:

- ☒ Examiner's Amendment
- ☐ Examiner Interview Summary Record, PTOL-413
- ☐ Reasons for Allowance
- ☒ Notice of References Cited, PTO-892
- ☐ Information Disclosure Citation, PTO-1449

- ☐ Notice of Informal Application, PTO-152
- ☐ Notice re Patent Drawings, PTO-948
- ☐ Listing of Banned Draftsmen
- ☐ Other

Jerry Smith
JERRY SMITH
SUPERVISORY PATENT EXAMINER
ART UNIT 236

TO SEPARATE, HOLD TOP AND BOTTOM EDGES, SNAP-APART AND DISCARD CARBON

1 05 2

FORM PTO-892 (REV. 3-78)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		SERIAL NO. 0740217	GROUP/UNIT 2306	ATTACHMENT TO PAPER NUMBER S	
NOTICE OF REFERENCES CITED				APPLICANT(S) Sean C. McDonald et al.			
U.S. PATENT DOCUMENTS							
*	DOCUMENT NO.	DATE	NAME	CLASS	SUB-CLASS	FILING DATE IF APPROPRIATE	
*A	5047948	9/10/91	Turner	364	479	4/25/88	
*B	3918045	11/4/75	Williams et al.	221	15		
*C	5636462	7/30/91	Kaufman et al.	364	479	9/29/86	
D							
E							
F							
G							
H							
I							
J							
K							
FOREIGN PATENT DOCUMENTS							
*	DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUB-CLASS	PERTINENT SMTS. DWGS. SPEC.
L							
M							
N							
O							
P							
Q							
OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)							
R							
S							
T							
U							
EXAMINER Sim Tamme II				DATE 1/14/92			
* A copy of this reference is not being furnished with this office action. (See Manual of Patent Examining Procedure, section 707.05 (a).)							

M0125379



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: Box ISSUE FEE
COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

LYNN J. ALSTADT
BUCHANAN INGERSOLL, P.C..
56TH FLR., 600 GRANT ST.
PITTSBURGH, PA 15219

Corrected
NOTICE OF ALLOWANCE
AND ISSUE FEE DUE

- ☐ Note attached communication from the Examiner
☐ This notice is issued in view of applicant's communication filed

SERIES CODE/SERIAL NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
07/469,217	01/24/90	013	TRAMMELL, J	2306 01/23/92
First Named Applicant	MC DONALD, SEAN C.			

TITLE OF INVENTION: SYSTEM FOR SELECTING AND DELIVERING PACKAGES FROM A HOLDING AREA TO FILL ORDERS (AS AMENDED)

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN TYPE	SMALL ENTITY	FEE DUE	DATE DUE
2 1797003	364-478.000	W52	UTILITY	YES	\$565.00	04/23/92

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT.
PROSECUTION ON THE MERITS IS CLOSED.

THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.

HOW TO RESPOND TO THIS NOTICE:

I. Review the SMALL ENTITY Status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

- A. If the Status is changed, pay twice the amount of the FEE DUE shown above and notify the Patent and Trademark Office of the change in status, or
B. If the Status is the same, pay the FEE DUE shown above.

If the SMALL ENTITY is shown as NO:

- A. Pay FEE DUE shown above, or
B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.

II. Part B of this notice should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by a charge to deposit account, Part B should be completed and returned. If you are charging the ISSUE FEE to your deposit account, Part C of this notice should also be completed and returned.

III. All communications regarding this application must give series code (or filing date), serial number and batch number. Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees.

PATENT AND TRADEMARK OFFICE COPY

M0125380



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: Box ISSUE FEE
COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

ANSEL M. SCHWARTZ
ALDER, COHEN AND GRIGSHY
625 LIBERTY AVE.,
PITTSBURGH, PA 15222

NOTICE OF ALLOWANCE
AND ISSUE FEE DUE

- ☐ Note attached communication from the Examiner
☐ This notice is issued in view of applicant's communication filed

SERIES CODE/SERIAL NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
07/469,217	01/24/90	013	TRAMMELL, J	2306 01/23/92

First Named Applicant: MC DONALD, SEAN C.

TITLE OF INVENTION: SYSTEM FOR SELECTING AND DELIVERING PACKAGES FROM A HOLDING AREA TO
FILL ORDERS (AS AMENDED)

	ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
2	1797003	364-478.000	W52	UTILITY	YES	\$565.00	04/23/92

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT.
PROSECUTION ON THE MERITS IS CLOSED.

THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS
APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.

HOW TO RESPOND TO THIS NOTICE:

I. Review the SMALL ENTITY Status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

- A. If the Status is changed, pay twice the amount of the FEE DUE shown above and notify the Patent and Trademark Office of the change in status, or
B. If the Status is the same, pay the FEE DUE shown above.

If the SMALL ENTITY is shown as NO:

- A. Pay FEE DUE shown above, or
B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.

- II. Part B of this notice should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by a charge to deposit account, Part B should be completed and returned. If you are charging the ISSUE FEE to your deposit account, Part C of this notice should also be completed and returned.
III. All communications regarding this application must give series code (or filing date), serial number and batch number. Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees.

PATENT AND TRADEMARK OFFICE COPY

M0125381

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



11/6

Group Art Unit : PATENT APPLICATION
 Examiner J. Trammell :
 In re application of :
 SEAN McDONALD et al. : SYSTEM FOR FILLING ORDERS
 Serial No. 07/469,217 :
 Filed January 24, 1990 :

RECEIVED
 NOV 15 1991

POWER OF ATTORNEY

GRANT

Automated Healthcare, Inc., assignee of the above-identified application, hereby appoints Lynn J. Alstadt, Registration No. 29,362; George P. Baier, Registration No. 26,717; Paul A. Beck, Registration, No. 22,289; Michael L. Dever, Registration No. 32,216; Gordon R. Harris, Registration No. 15,384; George Raynovich, Jr., Registration No. 19,829 and Alvin E. Ring, Registration No. 18,697, of the firm of Buchanan Ingersoll, P.C., whose post office address is 56th Floor, 600 Grant Street, Pittsburgh, Pennsylvania 15219, our attorneys in the above-identified application with full power of substitution and revocation, to amend or otherwise act relative to it as they may deem advisable, to transact all business in the Patent and Trademark Office in connection therewith and generally to do all matters and things needful in the premises, as fully and to all intents and purposes as the undersigned could do.

All powers of attorney previously given are hereby
revoked.

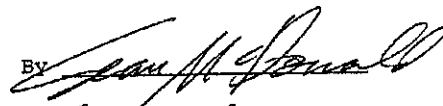
Please address all future correspondence to:

Lynn J. Alstadt
BUCHANAN INGERSOLL, P.C.
56th Floor
600 Grant Street
Pittsburgh, Pennsylvania 15219
412-462-1632

Signed this 31 day of October, 1991

AUTOMATED HEALTHCARE, INC.

By


President
Title

M0125383



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit 236 : PATENT APPLICATION
Examiner J. Trammell :
In re application of :
SEAN McDONALD et al. : SYSTEM FOR FILLING ORDERS
Serial No. 07/469,217 :
Filed January 24, 1990 :

NEW POWER OF ATTORNEY AND
NEW CORRESPONDENCE ADDRESS

Pittsburgh, Pennsylvania 15219

November 1, 1991

Hon. Commissioner of Patents and Trademarks

Washington, D.C. 20231

Sir:

Enclosed is a new Power of Attorney including revocation
of the old Power.

Please address all future correspondence and telephone
calls in the above-entitled application to:

Lynn J. Alstadt
Buchanan Ingersoll, P.C.
56th Floor
600 Grant Street
Pittsburgh, Pennsylvania 15219
412-562-1632

Respectfully submitted,

BUCHANAN INGERSOLL, P.C.

By Lynn J. Alstadt
Lynn J. Alstadt
Registration 29,362
Attorneys for Applicants

I hereby certify that this correspondence is being reas-
sited with the United States Postal Service as first
class mail in an envelope addressed to: Commissioner
of Patents and Trademarks, Washington, D.C. 20231.
on 11-1-91

Angie [Signature]
Buchanan Ingersoll

(412) 562-1632

M0125384



U.S. DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
 Washington, D.C. 20231

J. Trammell: art unit 236

469,217 1/24/90
 S. McDonald, et al

Paper No. 7

Ansel M. Schwartz
 Alder, Cohen & Grigshy
 625 Liberty Ave.
 Pittsburgh, PA 15222

MAILED
JAN 30 1992
GROUP 230

This is in response to the communication re the Power of Attorney filed 11/4/91

assignee.

1. ☒ The power of attorney to you in this application has been revoked by the ~~applicant~~.
2. ☐ In view of the notice in this application of the death of _____
 his power of attorney is terminated.
3. ☒ The power of attorney to you in this application has been accepted by the Commissioner of Patents, & Trademarks.
4. ☐ The assignee in this application has intervened and appointed an attorney of his own selection. Further correspondence will be held with said attorney. (Rule 36, Rules of Practice.)
5. ☐ The revocation of the power of attorney to _____ has been
 entered and said attorney has been notified. Further correspondence will be addressed to you.
 assignee
6. ☐ On _____, the applicant appointed _____
 as additional attorney in this application. Further correspondence will continue to be addressed to you as specified
 in the new power of attorney.
 assignee
7. ☐ On _____, the applicant appointed _____
 as additional attorney in this application. Further correspondence will be addressed to said attorney. MPEP 403.02
8. ☐ The associate power of attorney to you in this application has been revoked by the attorney of record.

Lynn J. Alstadt, et al

Lynn J. Alstadt
 BUCHANAN INGERSOL, P. C.
 56th Flr., 600 Grant St.
 Pittsburgh, PA. 15219

[Signature]
 Per Director, Operation

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FORM PTOL-305 (REV. 9/90)

Copy A

M0125385


**UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office**

 Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
07/469,217	01/24/90	MC DONALD	S 1797003

 LYNN J. ALSTADT
BUCHANAN INGERSOLL, P.C.
56TH FLR., 600 GRANT ST.
PITTSBURGH, PA 15219

EXAMINER	
TRAMMELL, J	
ART UNIT	PAPER NUMBER
2305	8

DATE MAILED: 10/22/92

NOTICE OF ABANDONMENT

This application is abandoned in view of:

1. ☐ Applicant's failure to respond to the Office letter, mailed _____.
2. ☐ Applicant's letter of express abandonment which is in compliance with 37 C.F.R. 1.136.
3. ☐ Applicant's failure to timely file the response received _____ within the period set in the Office letter.
4. ☒ Applicant's failure to pay the required issue fee within the statutory period of 3 months from the mailing date of 01-23-92 of the Notice of Allowance.

- ☐ The issue fee was received on _____.
- ☐ The issue fee has not been received in Allowed Files Branch as of _____.

In accordance with 35 U.S.C. 151, and under the provisions of 37 C.F.R. 1.316(b), applicant(s) may petition the Commissioner to accept the delayed payment of the issue fee if the delay in payment was unavoidable. The petition must be accompanied by the issue fee, unless it has been previously submitted, in the amount specified by 37 C.F.R. 1.17 (f), and a verified showing as to the causes of the delay.

If applicant(s) never received the Notice of Allowance, a petition for a new Notice of Allowance and withdrawal of the holding of abandonment may be appropriate in view of *Delgar Inc. v. Schuyler*, 172 U.S.P.Q. 513.

5. ☐ Applicant's failure to timely correct the drawings and/or submit new or substitute formal drawings by _____ as required in the last Office action.
☐ The corrected and/or substitute drawings were received on _____.
6. ☐ The reason(s) below.

 DIRECT ANY INQUIRIES TO :
PUBLISHING DIVISION
MARCIA CAMPBELL
(703) 305-8190
OR
PRISCILLA FULLER
(703) 305-8203



US005468110A

United States Patent [19]

McDonald et al.

[11] Patent Number: **5,468,110**[45] Date of Patent: **Nov. 21, 1995**[54] **AUTOMATED SYSTEM FOR SELECTING
PACKAGES FROM A STORAGE AREA**[75] Inventors: Sean C. McDonald, Pittsburgh, Pa.;
Ellen J. Hertz, Clemmons, N.C.;
James A. Smith, Allison Park, Pa.;
Gregory Toto, Santa Cruz, Calif.[73] Assignee: Automated Healthcare, Inc.,
Pittsburgh, Pa.

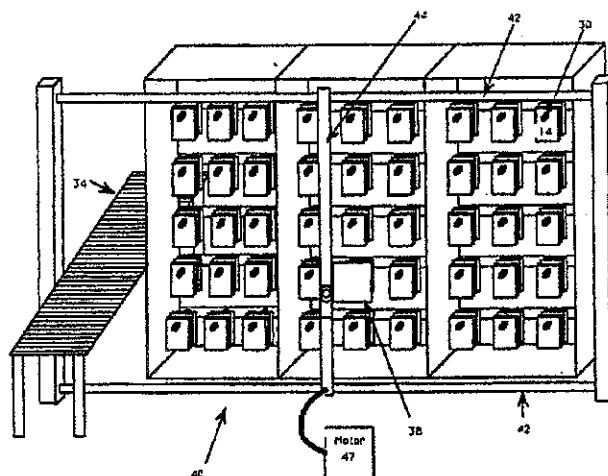
[21] Appl. No.: 295,495

[22] Filed: Aug. 25, 1994

Related U.S. Application Data[63] Continuation of Ser. No. 871,832, Apr. 21, 1992, abandoned,
which is a continuation-in-part of Ser. No. 469,217, Jan. 24,
1990, abandoned.[51] Int. Cl.⁴ B65G 1/04[52] U.S. Cl. 414/273; 364/478; 414/280;
414/268; 414/281; 414/285[58] Field of Search 235/385, 351;
414/266, 267, 268, 269, 270, 273, 274,
277, 280, 281, 282, 331, 285; 221/3, 9,
15; 364/478, 413.02, 479[56] **References Cited****U.S. PATENT DOCUMENTS**3,802,580 4/1974 Castaldi 414/280 X
3,985,612 10/1975 Kazuo et al. 209/111.7
4,546,901 10/1985 Buitrago 414/280 X
4,651,863 3/1987 Reuter et al. 414/280 X4,669,047 5/1987 Chueta 414/331 X
4,687,390 7/1987 Bonneton et al. 414/282
4,786,329 11/1985 Henderson 414/273 X
4,789,295 12/1988 Boucher, Jr. et al. 414/280 X
4,792,270 12/1988 Yoshida 414/273
4,812,629 3/1989 O'Neil et al. 414/274 X
4,820,109 4/1989 Wu 414/282
4,896,024 1/1990 Morello et al. 414/274 X
5,129,777 7/1992 Pohjonen et al. 414/280**FOREIGN PATENT DOCUMENTS**2596399 10/1987 France 414/273
304 1/1979 WIPO
85/00332 8/1984 WIPOPrimary Examiner—Frank E. Werner
Attorney, Agent, or Firm—Buchanan Ingersoll; Lynn J.
Alstad;**(57) ABSTRACT**

A system for filling orders, such as prescriptions for patients, comprising a device for holding packages. Each package has the same type of contents being held in a predetermined location by the holding device. Each package has an identity which defines the contents therein. The holding device has a plurality of predetermined locations corresponding to a plurality of different types of contents. Additionally, the system is comprised of a device for supplying packages to the holding device. Also, there is a device for picking a package from the holding device that is identified in the order for the purpose of restocking the holding device. The picking device is in communication with the holding device and supplying device. In a preferred embodiment, the contents of each package is a single dosage of medicine.

22 Claims, 19 Drawing Sheets



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[illegible]

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FORM PTO-878 REV. 1-88	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	SERIAL NO. 469,217	FILING DATE 1-24-90
PATENT APPLICATION FEE DETERMINATION RECORD		APPLICANT (FIRST NAMED) McDonald's	

CLAIMS AS FILED - PART I

FOR	NO FILED	NO EXTRA
BASIC FEE		
TOTAL CLAIMS	23	3
INDEP. CLAIMS	6	3
MULTIPLE DEPENDENT CLAIM PRESENT		

* If the entry in Col. 1 is less than 20, enter "0" in Col. 2

SMALL ENTITY

RATE	FEE
	\$ 185
x 6	\$ 18
x 18	\$ 18
60	\$
TOTAL	\$ 239

OTHER THAN A
SMALL ENTITY

RATE	FEE
	\$ 370
x 12	\$ 12
x 36	\$ 36
120	\$
TOTAL	\$

CLAIMS AS AMENDED - PART II

AMENDMENT A	(1)	(2)	(3)
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NO PREVIOUSLY PAID FOR	PRESENT EXTRA.
	TOTAL	MINUS	
	INDEP.	MINUS	
FIRST PRESENTATION OF MULTIPLE DEP. CLAIM			

SMALL ENTITY

RATE	ADDIT. FEE
x 6	\$
x 18	\$
60	\$
TOTAL	\$

OTHER THAN A
SMALL ENTITY

RATE	ADDIT. FEE
x 12	\$
x 36	\$
120	\$
TOTAL	\$

AMENDMENT B	(1)	(2)	(3)
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NO PREVIOUSLY PAID FOR	PRESENT EXTRA.
	TOTAL	MINUS	
	INDEP.	MINUS	
FIRST PRESENTATION OF MULTIPLE DEP. CLAIM			

RATE	ADDIT. FEE
x 6	\$
x 18	\$
60	\$
TOTAL	\$

RATE	ADDIT. FEE
x 12	\$
x 36	\$
120	\$
TOTAL	\$

AMENDMENT C	(1)	(2)	(3)
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NO PREVIOUSLY PAID FOR	PRESENT EXTRA.
	TOTAL	MINUS	
	INDEP.	MINUS	
FIRST PRESENTATION OF MULTIPLE DEP. CLAIM			

RATE	ADDIT. FEE
x 6	\$
x 18	\$
60	\$
TOTAL	\$

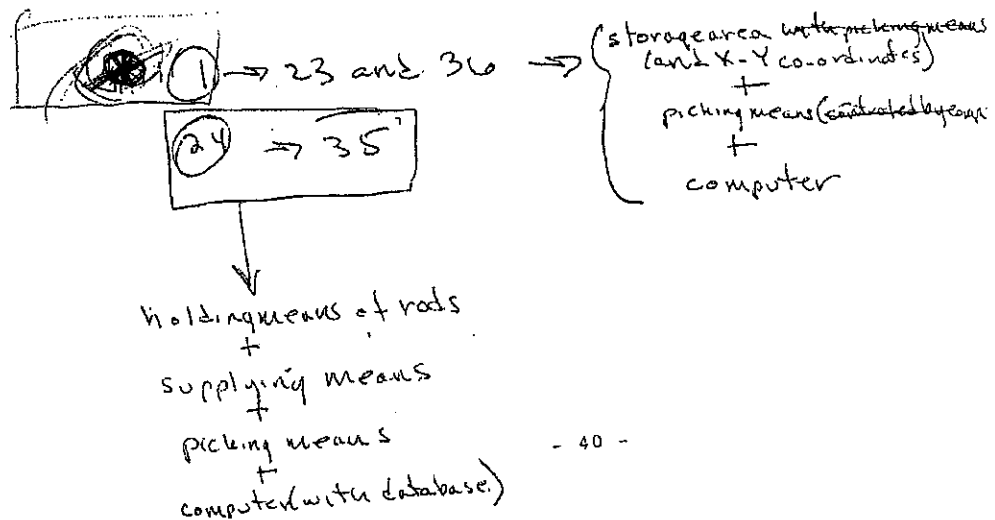
RATE	ADDIT. FEE
x 12	\$
x 36	\$
60	\$
TOTAL	\$

* If the entry in Col. 1 is less than the entry in Col. 2, enter "0" in Col. 3

** If the highest No. Previously Paid For in THIS SPACE is less than 20, enter "20"

*** If the highest No. Previously Paid For in THIS SPACE is less than 1, enter "1"

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- 40 -

<input type="checkbox"/> Transfer Disapproved-Forward to Originating A.U.		Concurring _____
REASON:		Classifier _____
Nonclassification issue raised:		<input type="checkbox"/> Restriction
		<input type="checkbox"/> Other

* U.S.GPO:1991-0-281-804/40410

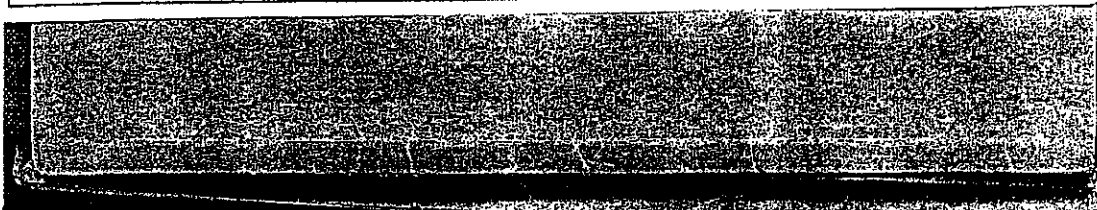


Exhibit E

Part 2

08/295495 UTILITY SERIAL NUMBER		PATENT DATE NOV 21 1995		PATENT NUMBER	
SERIAL NUMBER 08/295,495		FILING DATE 08/25/94		CLASS 414	
SUBCLASS 273		GROUP PART UNIT 3107		EXAMINER MURDER	

APPLICANTS: SEAN D. McDONALD, PITTSBURGH, PA; ELLEN J. HERTZ, CLEMMONS, TN; JAMES A. SMITH, ALLISON PARK, PA; GREGORY TOTO, SANTA CRUZ, CA.

CONTINUING DATA***
 VERIFIED THIS APPLN IS A CON OF 07/871,832 04/21/92, 3/6 *Continued*
 WHICH IS A CIP OF 07/469,217 01/24/90 ABN

FOREIGN/PCT APPLICATIONS***
 VERIFIED

CERTIFICATE
 APR 16 1996
OF CORRECTION
 ***** SMALL ENTITY *****

FOREIGN FILING LICENSE GRANTED 10/01/94

Foreign priority claimed 35 USC 119 conditions met	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	AS FILED	STATE OR COUNTRY PA	SHEETS OR DWS. 19	TOTAL CLAIMS 24	INDEP. CLAIMS 2	FILING FEE RECEIVED \$399.00	ATTORNEY'S DOCKET NO. 920015
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Verified and Acknowledged *Examiner's Initials*

ADDRESS: LYNN J. ALSTADT
 BUCHANAN INGERSOLL
 600 GRANT STREET, 56TH FLOOR
 PITTSBURGH, PA 15219

TITLE: AUTOMATED SYSTEM FOR SELECTING PACKAGES FROM A STORAGE AREA

U.S. DEPT. of COMM., Pat. & TM Office - PTO-436L (rev. 10-78)

PARTS OF APPLICATION FILED SEPARATELY		A. Dabady 3/9/95 Applications Examiner	
NOTICE OF ALLOWANCE MAILED MAR 07 1995		CLAIMS ALLOWED Total Claims 22 Print Claim 1	
ISSUE FEE Amount Due 605.00 Date Paid 6-9-95		DRAWING Sheets Drwg. 19 Figs. Drwg. 19 Print Fig. 6	
Label Area		FRANK E. WERNER PRIMARY EXAMINER GROUP 3100 Primary Examiner	
PREPARED FOR ISSUE		ISSUE BATCH NUMBER 550	

WARNING: The information disclosed herein may be restricted. Unauthorized disclosure may be prohibited by the United States Code Title 35, Sections 122, 181 and 366. Possession outside the U.S. Patent & Trademark Office is restricted to authorized employees and contractors only.

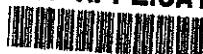
Form PTO-436L
 Rev. 9/92

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Date
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PATENT APPLICATION



08295495

CONTENTS

APPROVED FOR LICENSE ☐

INITIALS _____

RECEIVED
Date
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or
Mailed
AUG 20 1994
GROUP 310

1. Application _____ papers.

12. *See Amalt B*13. *Ref 3M*14. *Amalt C*15. *Interview Summary*16. *Ref 106 372*Notice of Outstanding Drawing
Requirement17. *None*18. *When Drawings (7) sent 10/1/95*

PTO GRANT NOV 21 1995

20. *Ref C2C Rule 332*

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Feb 8, 1995

MAR 07 1995

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9/23/95

1/16/96

(FRONT)

GOVERNMENT PRINTING OFFICE: 1991 420

PATENT NUMBER

ORIGINAL CLASSIFICATION

CLASS 44 SUBCLASS 273

APPLICATION SERIAL NUMBER 08/295495

CROSS REFERENCE(S)

CLASS 364 478 414 280 268 281 285

APPLICANT'S NAME (PLEASE PRINT) Sean C. McDonald et al

IF REISSUE, ORIGINAL PATENT NUMBER

INTERNATIONAL CLASSIFICATION B 65 G 001/04

GROUP ART. UNIT 3/07

ASSISTANT EXAMINER (PLEASE STAMP OR PRINT FULL NAME)

PRIMARY EXAMINER (PLEASE STAMP OR PRINT FULL NAME) FRANK E. WERNER

PTO 270 (REV. 8-91)

ISSUE CLASSIFICATION SLIP GROUP 3100

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

Claim	Final	Original	Date
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3	✓	✓	
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SYMBOLS

- ✓ Rejected
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 O Collected

Claim	Final	Original	Date
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Standard Form 64

POSITION	ID NO.	DATE
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EXAMINER	405	11-1-01
TYPIST	523	11-1-01
VERIFIER		
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SPEC. HAND		
FILE MAINT.		
DRAFTING		

INDEX OF CLAIMS

Claim	Date
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SYMBOLS

✓ Allowed
 (Through numerical) Disallowed
 N Non-elected
 I Interference
 A Appeal
 O Objected

(LEFT INSIDE)

SEARCHED			
Class	Sub.	Date	Exmr.
235	385,351		
414	266, 267		
	268, 269		
	270, 273		
	274, 277		
	280, 281		
	282, 333		
221	5, 9, 15		
304	478, 413.02		
	479	11/94	RW
Above search updated		3/1/95	RW

SEARCH NOTES		
	Date	Exmr.
Search updated and references checked in parent's 871932 and 469217	11/94	RW

INTERFERENCE SEARCHED			
Class	Sub.	Date	Exmr.
Above interference searched		3/1/95	RW

(RIGHT OUTSIDE)

SERIAL NUMBER 07/871,832	PATENT DATE	PATENT NUMBER
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SERIAL NUMBER 07/871,832	FILING DATE 04/21/92	CLASS T 364	SUBCLASS 2B 478	GROUP/ART UNIT 3107 2306	EXAMINER W. EMMETT FRAMMELL
-----------------------------	-------------------------	-------------------	-----------------------	--------------------------------	-----------------------------------

SEAN C. McDONALD, PITTSBURGH, PA; ELLEN J. HERTZ, CLEMMONS, NC;
JAMES A. SMITH, ALLISON PARK, PA; GREGORY TOTO, SANTA CRUZ, CA.

CONTINUING DATA***
VERIFIED THIS APPLN IS A CIP OF 07/469,217 01/24/90, now abandoned

FOREIGN/PCT APPLICATIONS***
VERIFIED

FOREIGN FILING LICENSE GRANTED 07/08/92

***** SMALL ENTITY *****

Foreign priority claimed 35 USC 119 conditions met	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	AS FILED	STATE OR COUNTRY PA	SHEETS 19	TOTAL CLAIMS 36	INDEP. CLAIMS 2	FILING FEE RECEIVED \$570.00	ATTORNEY'S DOCKET NO. 920015
---	--	----------	------------------------	--------------	--------------------	--------------------	---------------------------------	---------------------------------

LYNN J. ALSTADT
BUCHANAN INGERSOLL PROFESSIONAL CORP.
56TH FLOOR, 600 GRANT ST.
PITTSBURGH, PA 15219

AUTOMATED SYSTEM FOR SELECTING AND DELIVERING PACKAGES FROM A STORAGE AREA

U.S. DEPT. of COMM., Pat. & TM Office - PTO-436L (rev. 10-78)

PARTS OF APPLICATION FILED SEPARATELY					
NOTICE OF ALLOWANCE/MAILED		PREPARED FOR ISSUE		CLAIMS ALLOWED	
				Total Claims	Print Claim
ISSUE FEE				DRAWING	
Amount Due	Date Paid			Sheets Drawn	Prints
		ISSUE CLASSIFICATION		ISSUE BATCH NUMBER	
		Class	Subclass		
WARNING: The information disclosed herein is unclassified and may be released to the public without restriction. It is the policy of the U.S. Patent and Trademark Office to make available to the public the information disclosed in patent applications and to make available to the public the information disclosed in trademark applications.					

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 JUL 11 MAY 04 9239
 INITIALS 310
Entered
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CONTENTS

Received
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1. Application papers

2. *Handwritten: 2004-400*3. *Handwritten: 6-24-92*4. *Handwritten: 7/23/92*5. *Handwritten: 10/28/93*6. *Handwritten: OCT 15 1993*7. *Handwritten: Feb 17 1994*8. *Handwritten: Feb 17 1994*9. *Handwritten: MAY 25 1994*10. *Handwritten: 30-20-994*11. *Handwritten: 11-26-94*

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INDEX OF CLAIMS

MA000063

[illegible][illegible][illegible]



US005468110A

United States Patent [19]

[11] Patent Number: 5,468,110

McDonald et al.

[45] Date of Patent: Nov. 21, 1995

[54] AUTOMATED SYSTEM FOR SELECTING
PACKAGES FROM A STORAGE AREA[75] Inventors: Sean C. McDonald, Pittsburgh, Pa.;
Ellen J. Hertz, Clammons, N.C.;
James A. Smith, Allison Park, Pa.;
Gregory Tuta, Santa Cruz, Calif.[73] Assignee: Automated Healthcare, Inc.,
Pittsburgh, Pa.

4,669,047	5/1987	Chen	414/331 X
4,687,390	7/1987	Bennett et al.	414/282
4,786,229	11/1988	Henderson	414/273 X
4,789,295	12/1988	Boucher, Jr. et al.	414/280 X
4,792,270	12/1988	Yoshida	414/273
4,812,629	3/1989	O'Neill et al.	414/274 X
4,820,109	4/1989	Witt	414/282
4,896,024	1/1990	Mordillo et al.	414/274 X
5,129,777	7/1992	Pohjonen et al.	414/280

FOREIGN PATENT DOCUMENTS

2596299	10/1987	France	
304	1/1979	WFO	414/273
85/00232	8/1984	WIPO	

Primary Examiner—Frank E. Werner

Attorney, Agent, or Firm—Buchanan Ingersoll; Lynn J.
Alstadt

[21] Appl. No.: 295,495

[22] Filed: Aug. 25, 1994

Related U.S. Application Data

[63] Continuation of Ser. No. 871,832, Apr. 21, 1992, abandoned,
which is a continuation-in-part of Ser. No. 469,217, Jan. 24,
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414/268; 414/281; 414/285[58] Field of Search 235/385, 351;
414/266, 267, 268, 269, 270, 273, 274,
277, 280, 281, 282, 331, 285; 221/3, 9,
15; 364/478, 413.02, 479

[56] References Cited

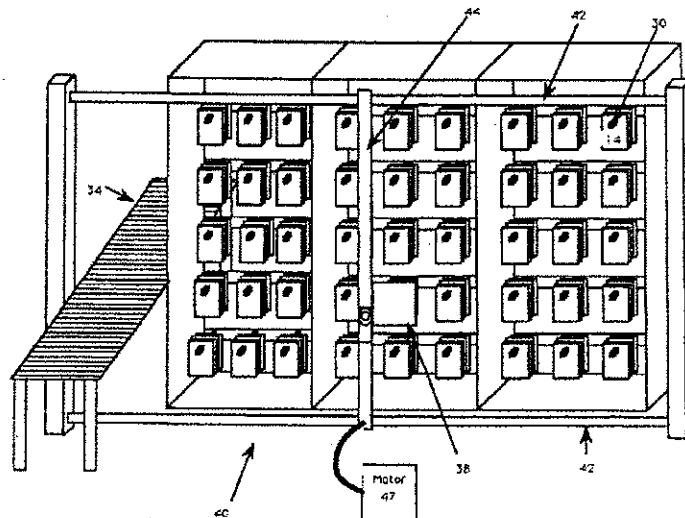
U.S. PATENT DOCUMENTS

3,802,580	4/1974	Castaldi	414/280 X
3,986,612	10/1976	Kanun et al.	209/111.7
4,546,901	10/1985	Bunarazzi	414/280 X
4,651,863	3/1987	Reuter et al.	414/280 X

[57] ABSTRACT

A system for filling orders, such as prescriptions for patients, comprising a device for holding packages. Each package has the same type of contents being held in a predetermined location by the holding device. Each package has an identity which defines the contents therein. The holding device has a plurality of predetermined locations corresponding to a plurality of different types of contents. Additionally, the system is comprised of a device for supplying packages to the holding device. Also, there is a device for picking a package from the holding device that is identified in the order for the purpose of restocking the holding device. The picking device is in communication with the holding device and supplying device. In a preferred embodiment, the contents of each package is a single dosage of medicine.

22 Claims, 19 Drawing Sheets



U.S. Patent

Nov. 21, 1995

Sheet 1 of 19

5,468,110

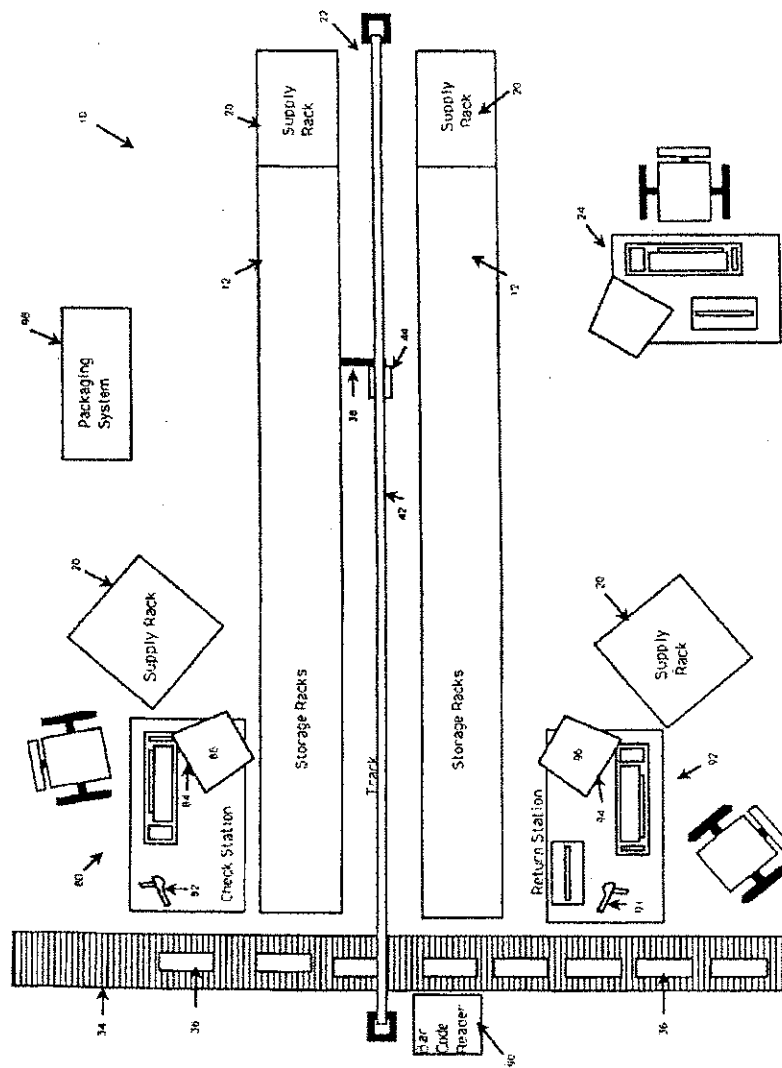


Figure 1

U.S. Patent

Nov. 21, 1995

Sheet 2 of 19

5,468,110

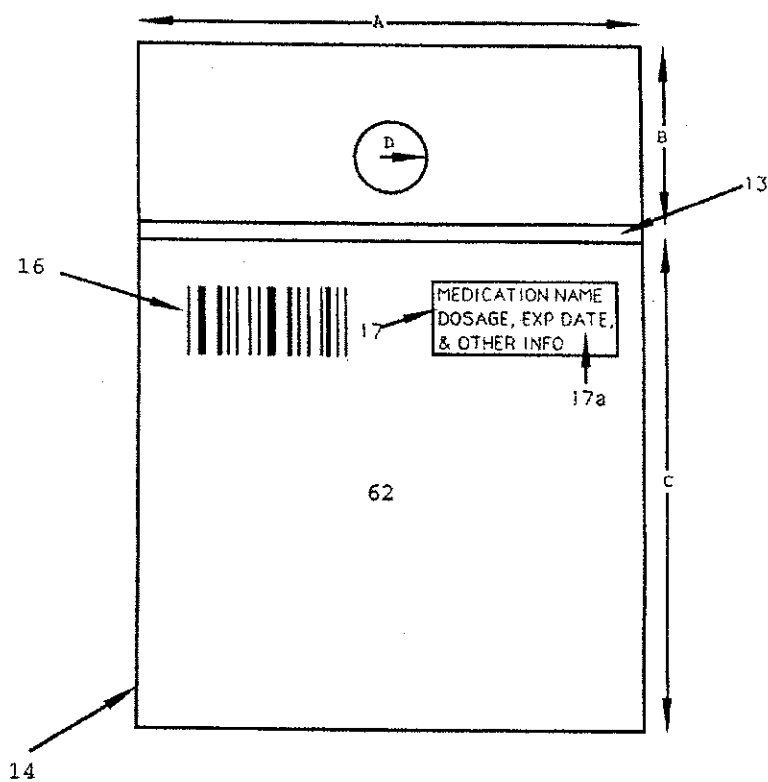


Figure 2

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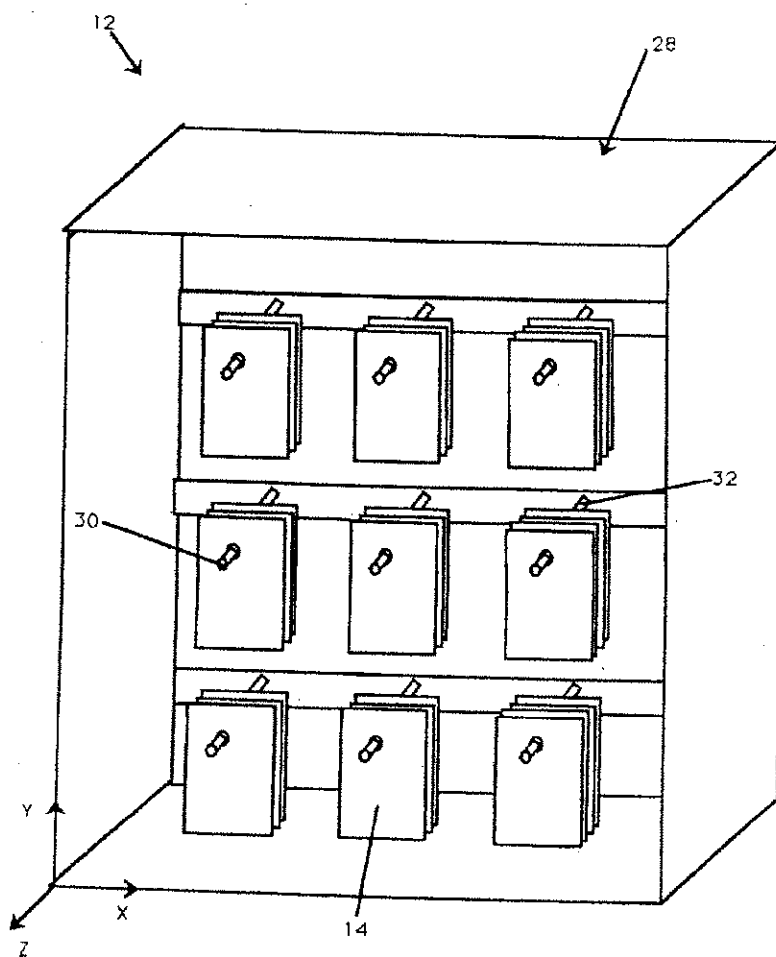


Figure 3

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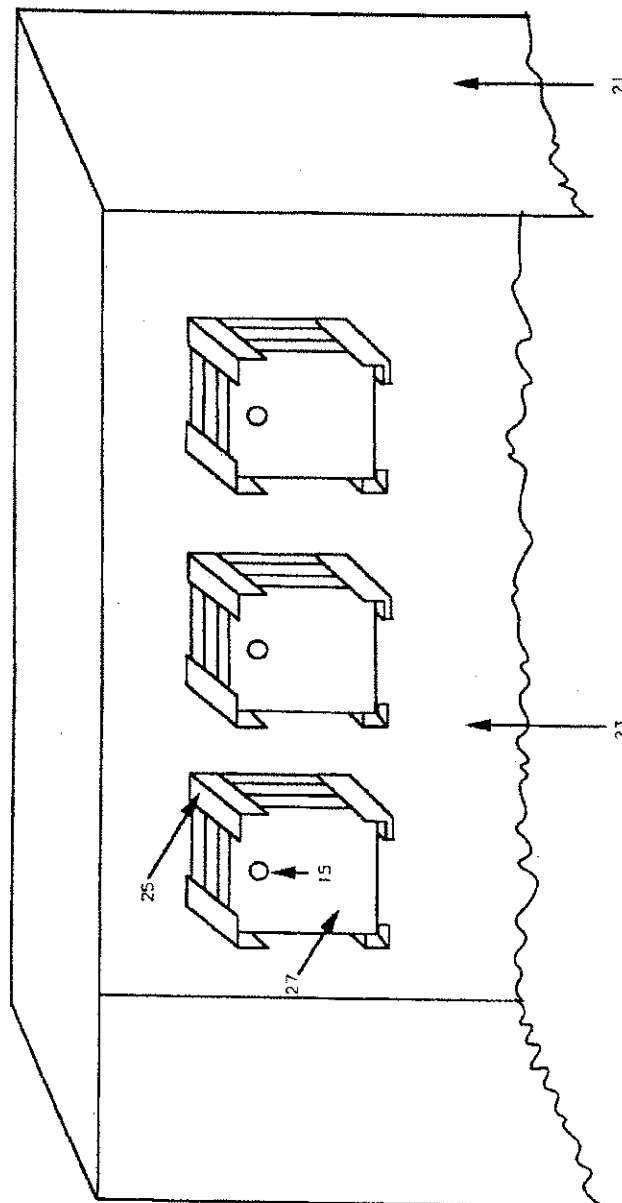


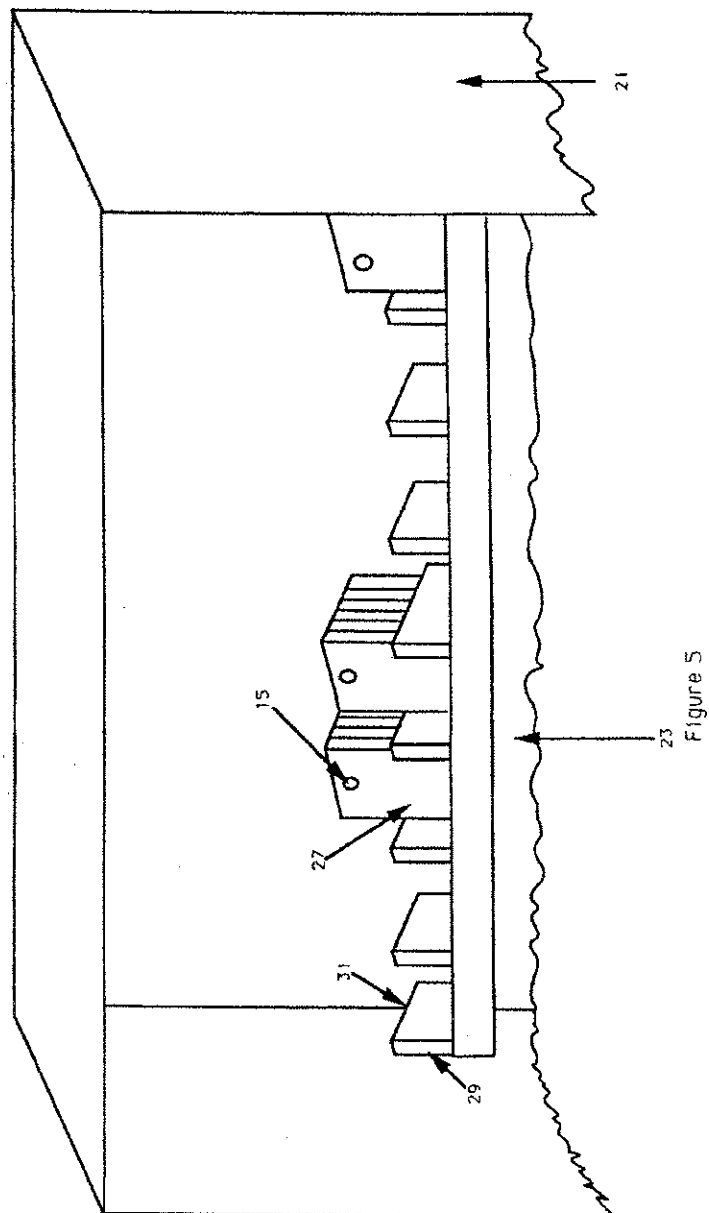
Figure 4

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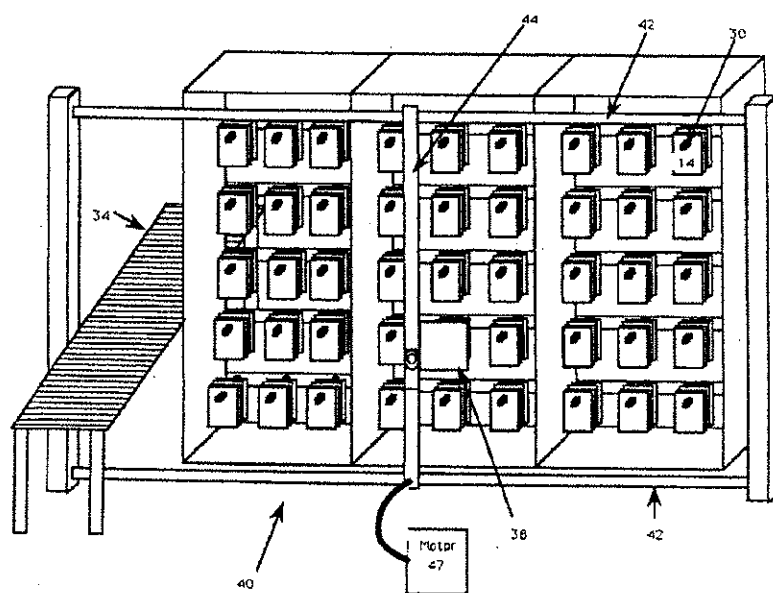


Figure 6

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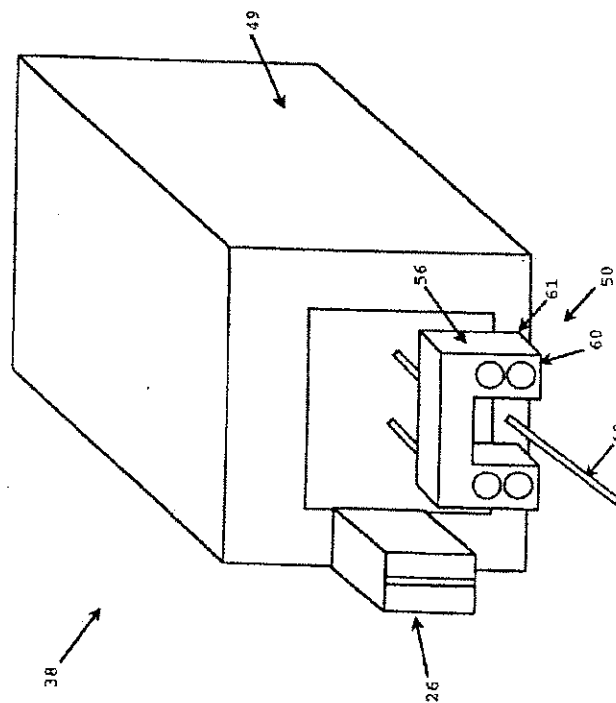


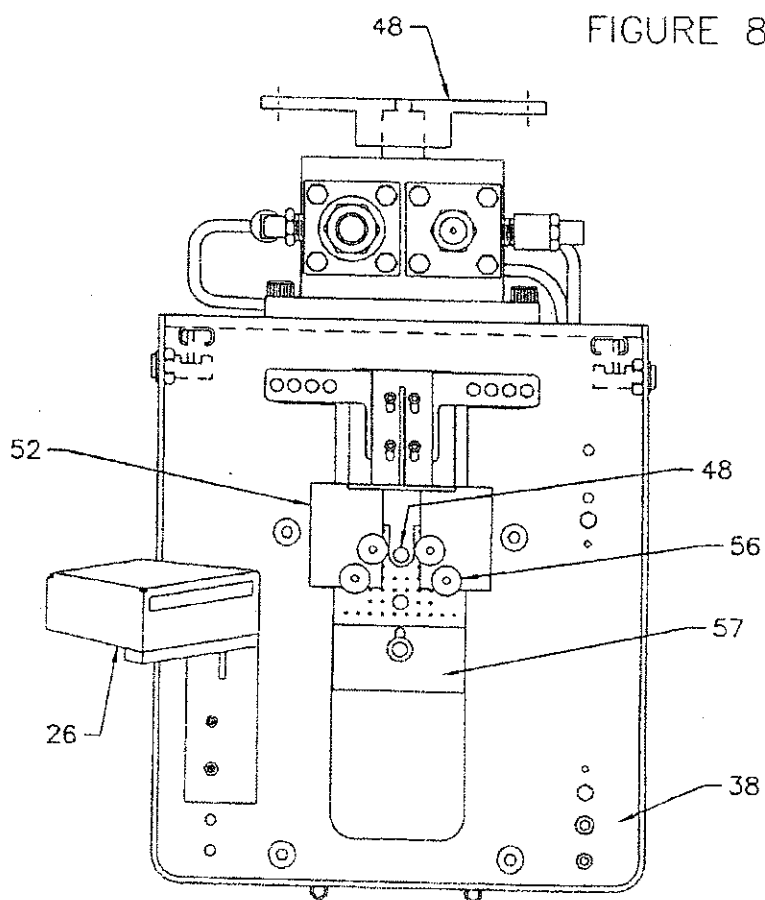
Figure 7

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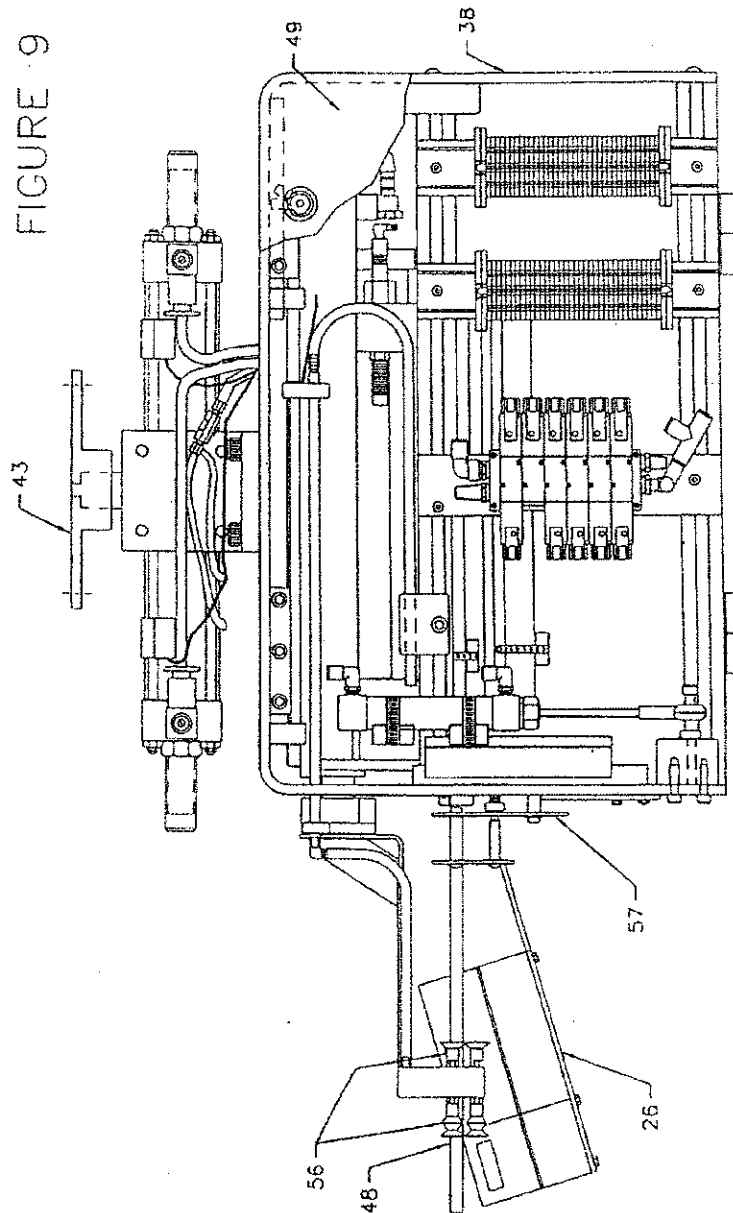


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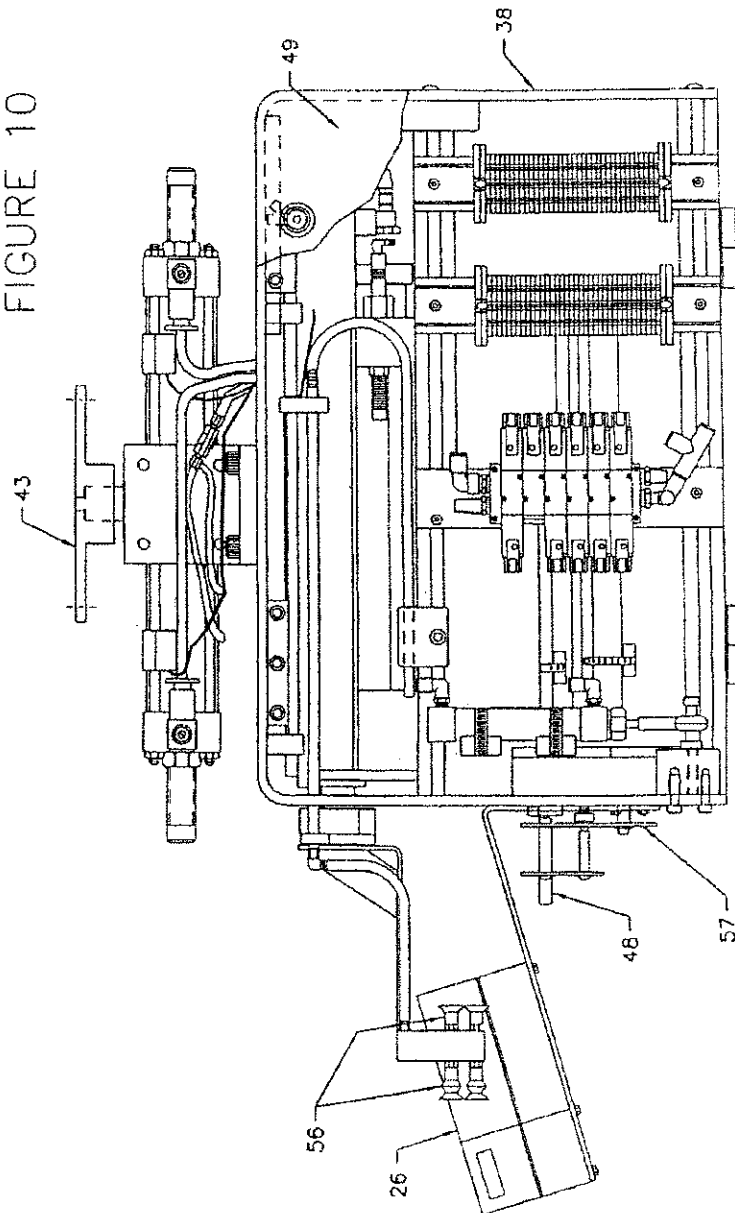
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FIGURE 10



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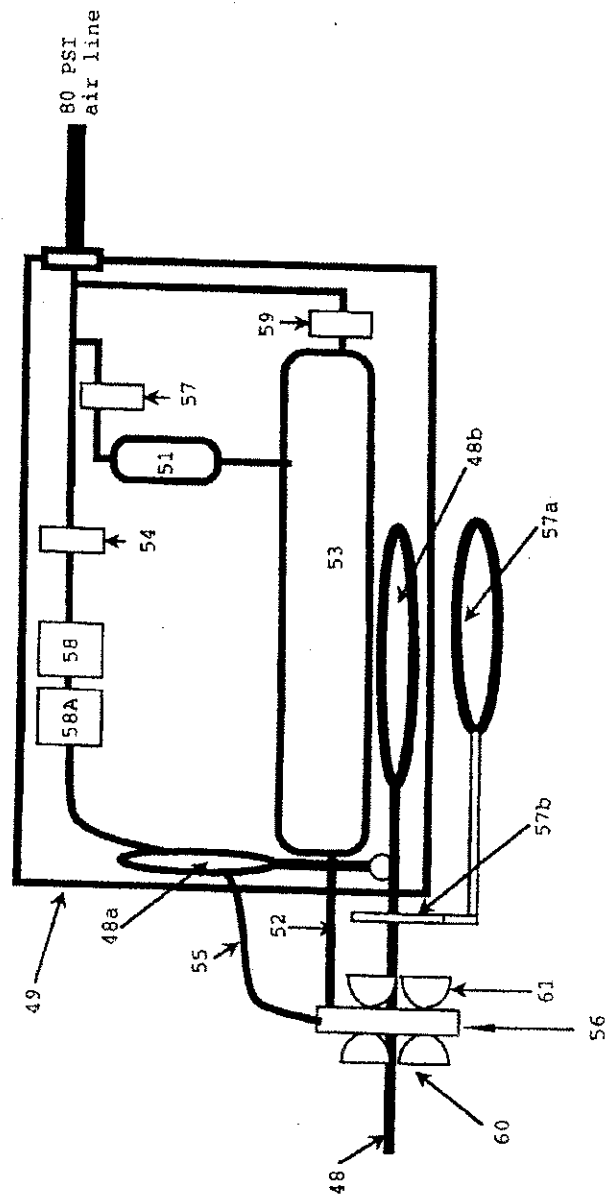


Figure 11

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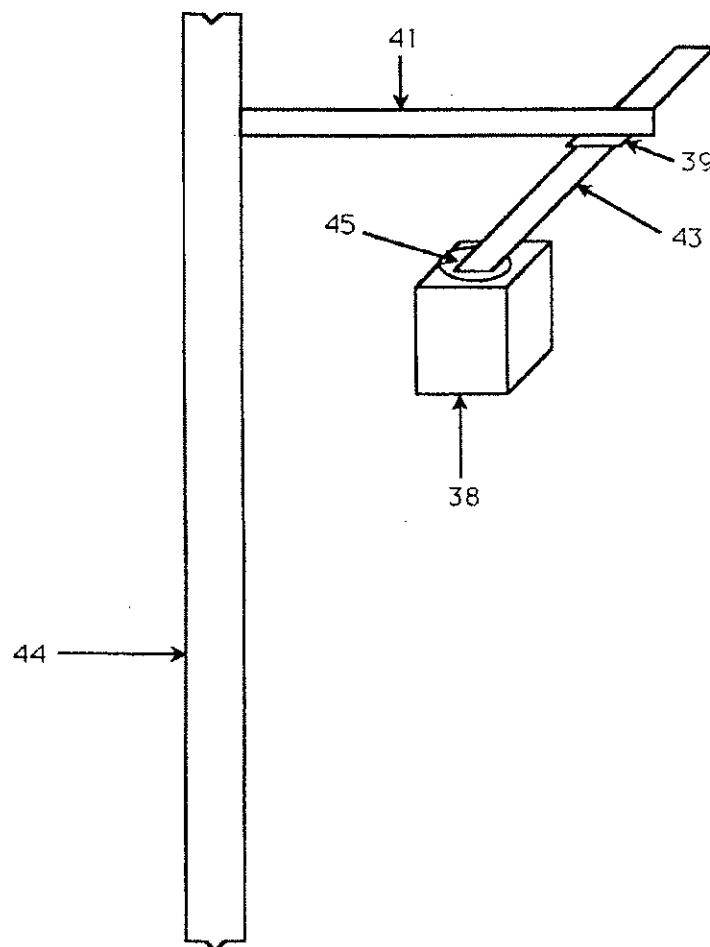


Figure 12

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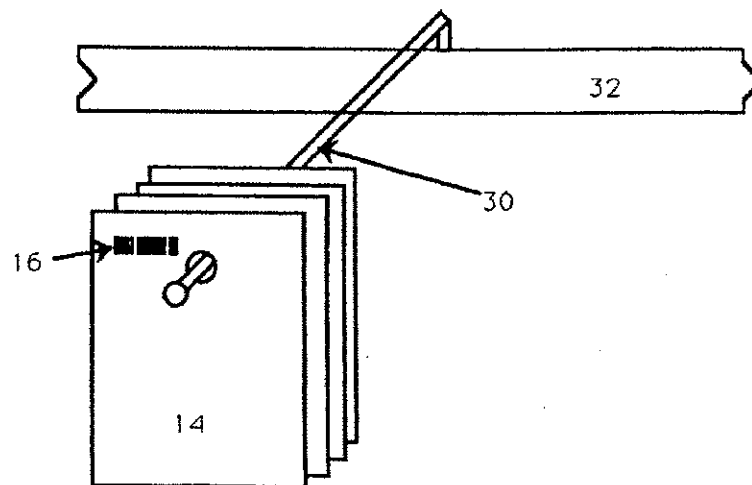


Figure 13

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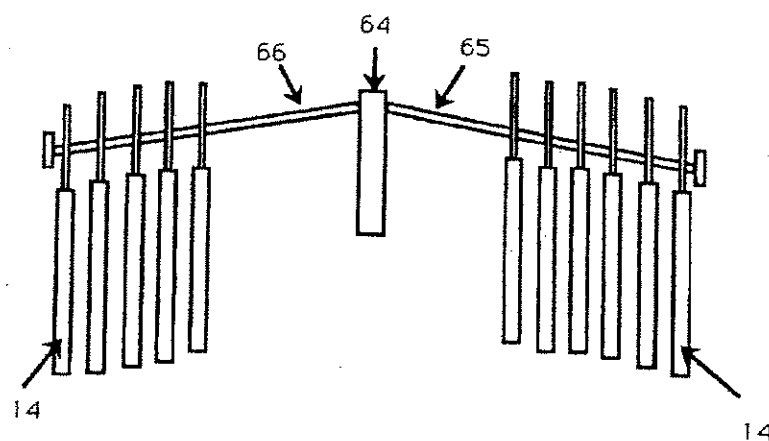


Figure 14

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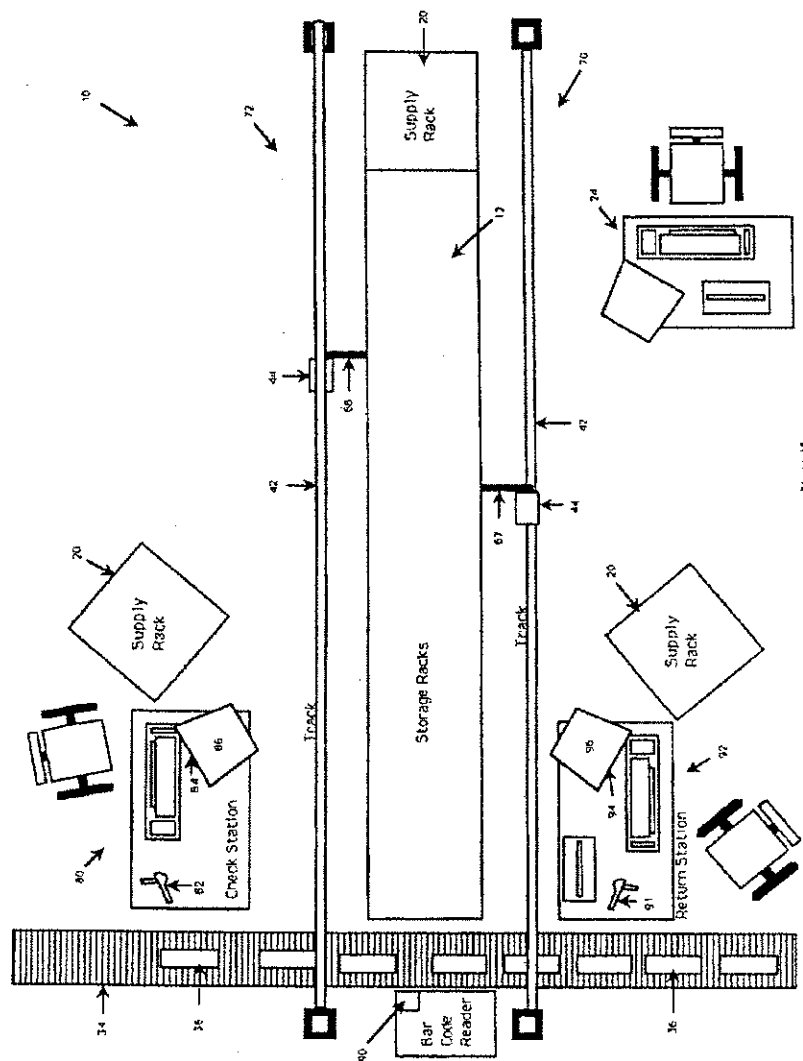


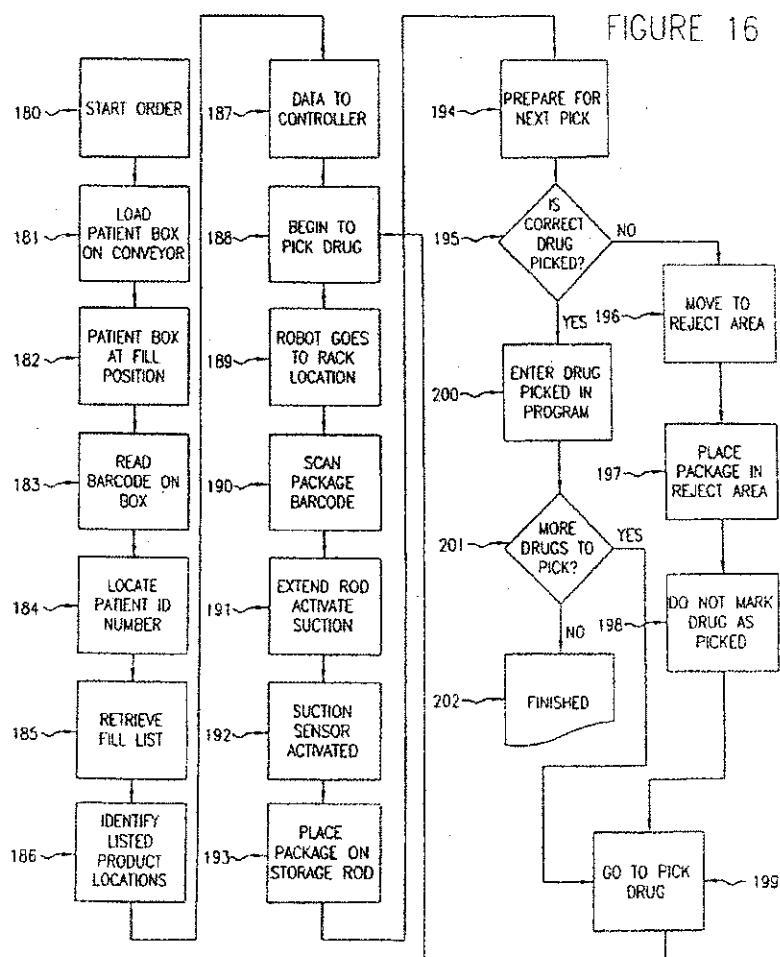
Figure 15

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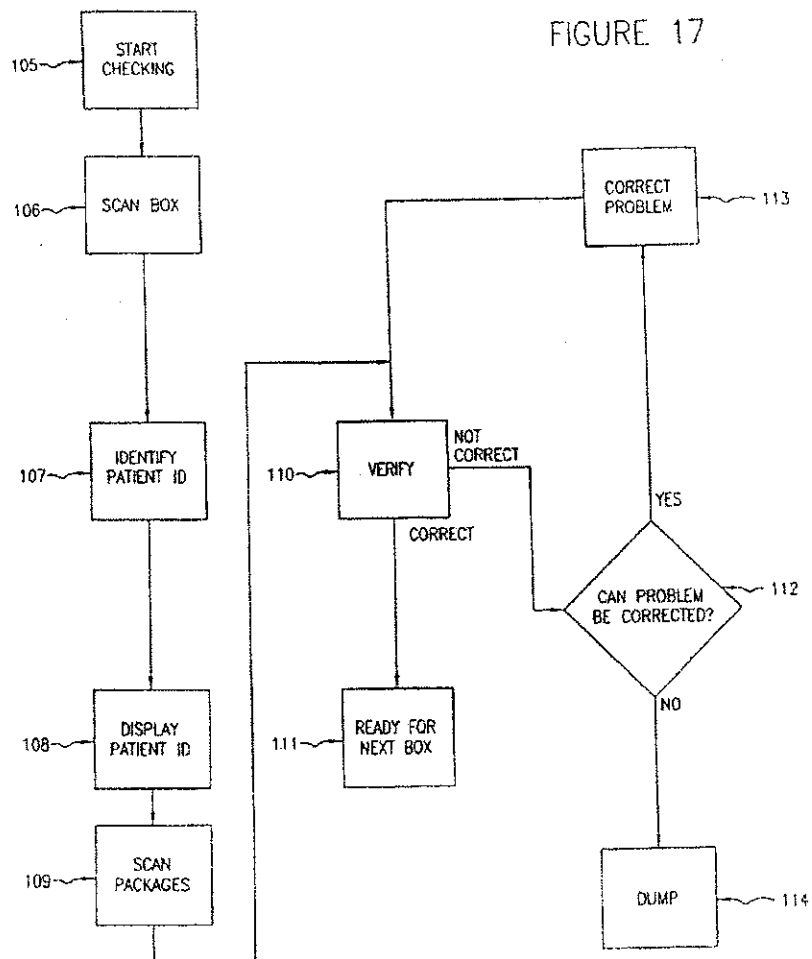
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FIGURE 17

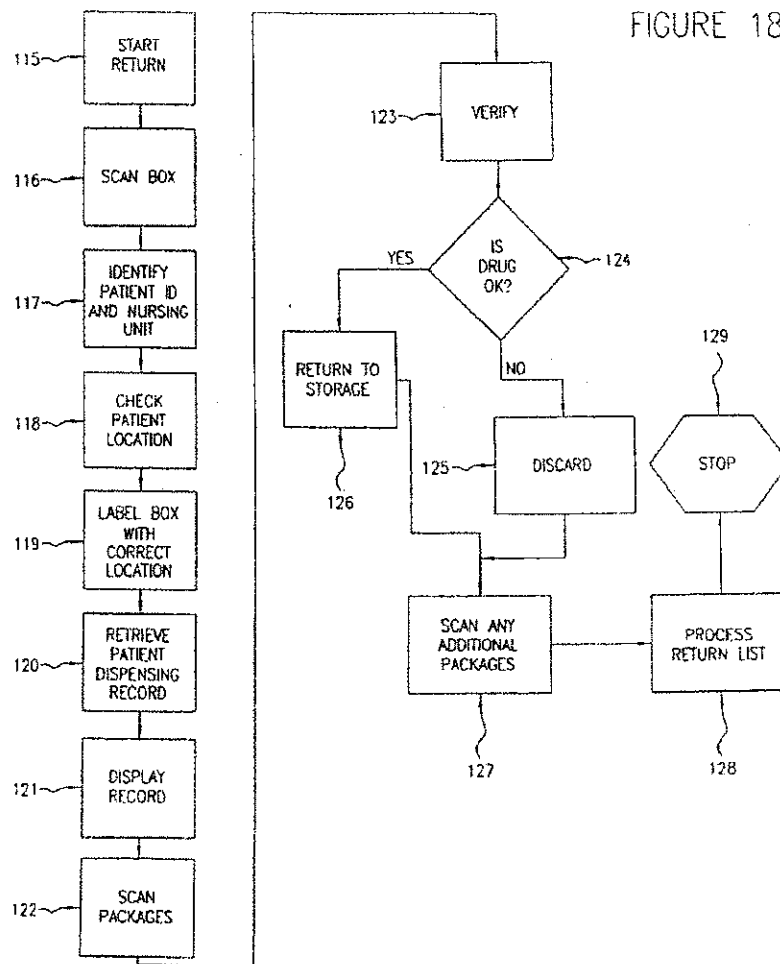


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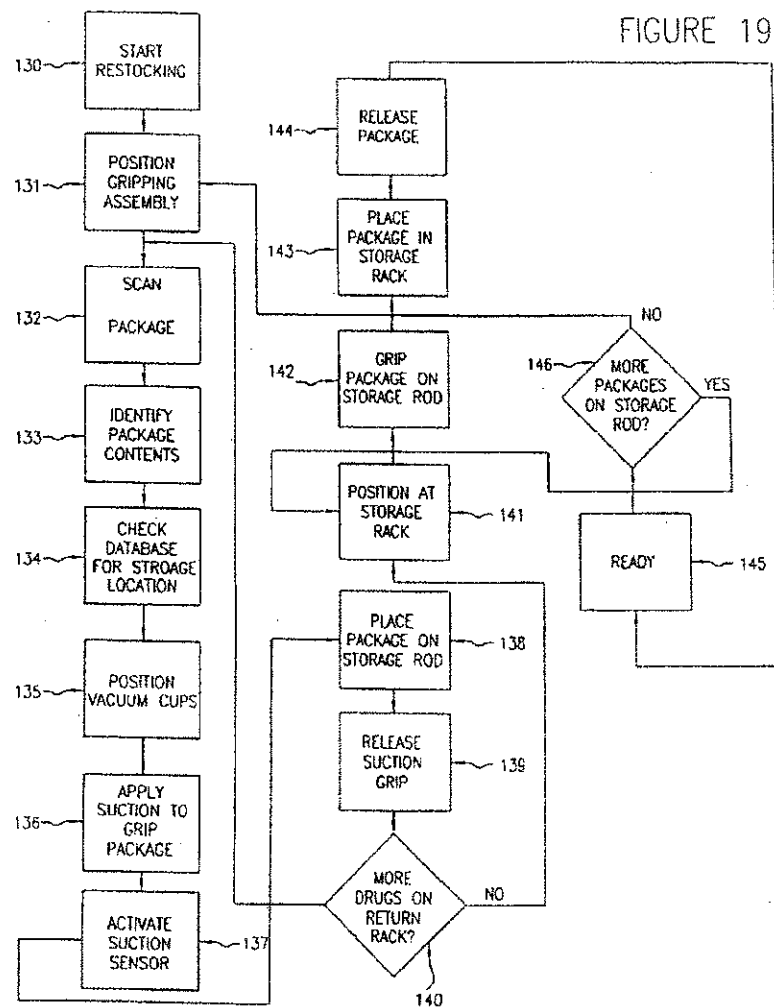


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1 AUTOMATED SYSTEM FOR SELECTING PACKAGES FROM A STORAGE AREA

RELATED APPLICATION

This is a continuation of Ser. No. 07/87832 filed Apr. 21, 1992, now abandoned which is a continuation-in-part of our U.S. patent application Ser. No. 07/489,217 filed Jan. 24, 1990, now abandoned.

FIELD OF THE INVENTION

The present invention relates to an automated system for selecting stored articles. More specifically, the present invention relates to an automated system for filling prescriptions and restocking medicines in a pharmacy.

BACKGROUND OF THE INVENTION

Many industries store products or parts in a storeroom or storage area and repeatedly select some of the stored items to fill orders or for other uses. Such items may range from small electronic components used by a manufacturer of electronic devices to automotive parts, which vary in size, used by service departments of automobile dealerships. Usually one or more people are employed to retrieve the requested items and to restock new and returned items. These individuals may also be required to confirm that the requested items are compatible with one another and with previously supplied items. If the supplied items are to be billed to a customer or charged to particular internal accounts, the list of items is first written by the requestor, and rewritten or entered into a computer database by the storeroom attendant to create an invoice, supply list or other document. In some instances, further generations of the list are made by installers, users or billing clerks. Such methods have built-in opportunities for mistakes every time a list is rewritten and are less efficient than automated systems. Moreover, as labor costs rise and the size of inventory needed to be stored expands, the conventional storeroom and parts department become more and more expensive.

Some businesses have attempted to control costs by limiting inventory through standardization of parts. But such limits are not possible or desirable in some industries, particularly in a hospital pharmacy.

Currently, in large hospital environments, doctors visit patients in nursing units and write out medication orders for each patient. A patient is typically placed on a certain medication which may require multiple doses of medication be administered over a period of a day. Some medications are administered at certain times of the day and possibly at intervals of several hours. Patients may also request certain medications on an elective basis for disorders such as headaches. These requests are included in the doctor's order that is sent from the nursing unit to the central pharmacy of the hospital.

Once an order is received by the pharmacy, it is checked by registered pharmacists and input into the pharmacy information system. These orders reflect not only orders that are added to a particular patient's treatment, but changes in the medication treatment. The pharmacy information system combines this information with the patient's existing medication schedule and develops a patient medication profile. A fill list is generated from that profile. The fill list is a list of all the medications that must be distributed to all patients for the day. This information is sent to the pharmacy printer where a hard copy is generated. Frequently, that hard copy

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or a copy thereof is sent to the billing department so that the medication can be charged to the patient or his insurer.

At this point, the drugs for a particular patient are hand-picked by either a pharmacist or a pharmacy technician and placed in the particular patient's designated box. A registered pharmacist must then check the accuracy of the patient order before it leaves the pharmacy. Individual patient boxes are then loaded into a large cassette and delivered to the nursing unit.

Approximately 30% of the drugs dispensed each day are returned to the pharmacy unused. Since each drug is individually packaged, the drugs must be returned to the pharmacy stock. Patients are then credited for unused medication. This return and crediting process is a very time-consuming task and requires significant amount of pharmacy manpower.

In a typical large pharmacy, up to 35 pharmacists and pharmacy technicians are responsible for all aspects of the unit dose dispensing task. Because this process is done manually, a certain amount of error occurs. Studies have estimated that a half-percent error rate is typical in a large hospital. Since a hospital may dispense over 6,000 doses each day, this error rate leads to a significant number of missed or incorrect doses.

Several companies have tried to automate this process through various approaches to the problem. Meditrol utilizes a vending machine approach to dispense the unit dose medications. Each nursing unit must have its own stock of prescription drugs. Nurses key in a patient ID and the drugs for that patient are then dispensed from the vending machine. This system is very expensive because of the necessity of purchasing a machine for each nursing unit. Also, restocking each machine is a very time-consuming task. Implementation of this system requires a complete modification of the current drug dispensing process which many hospitals are reticent to undertake. The system claims no labor-saving advantages from its implementation. This system is covered under U.S. Pat. No. 3,917,045 titled "Drug Dispensing Apparatus" and dated Nov. 11, 1975.

Baxter Travenol offers a dispensing system from Samsung, a Korean company, which dispenses bulk solids into a package which is dispensed to the pharmacist. This system only dispenses the 200 most frequently used solids. A typical hospital pharmacy can contain over 1,500 different medications, many in liquid, syringe or bottle form. These medications cannot be automatically dispensed by this system, but must be manually selected by the pharmacist.

Neither system allows the dispensed medications to be automatically returned to the storage area.

There is a need for an automated system which is able to dispense all dosage forms currently contained in a hospital pharmacy. Medicines should be automatically dispensed by the system per a patient order and placed in individual patient medication boxes for a pharmacist to check. Each drug and each patient box should be individually bar coded so that the accuracy of the dispensing process can be automatically checked by the system. Once drugs are returned to the pharmacy, the system should automatically return each drug to its proper location in inventory and credit the patient's account for the return. One system should also keep a running inventory and notify the user whenever inventory of a particular item drops below a preset level and whether the shelf life of an item has passed. With such a system, a hospital can recognize significant labor savings, as well as savings based on improved accuracy in the dispensing function and better tracking of inventory and expired medications.

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SUMMARY OF THE INVENTION

We provide an automated method and apparatus for selecting and restocking stored items, which is particularly useful for filling patient medication orders in a hospital pharmacy. The stored items must be packaged to be held in a storage rack. Preferably, each package contains a bar code corresponding to the package contents. The items are arranged in a main storage rack so that like items are in the same location and a predetermined location is provided for every item.

We prefer to provide a second rack or a designated portion of the main storage rack for receipt of new or returned items to be restocked. Such items can be randomly placed on this supply station for transmittal to their respective predetermined locations on the storage rack.

We also provide a means for picking items from and placing items in the storage rack and the supply station. The picking means preferably is comprised of a gripper assembly mounted on a transport vehicle which moves along a track or other controlled route. The gripper assembly preferably has a movable rod or other carrier for holding selected items, at least one vacuum head and associated controls for gripping and moving selected items. We prefer to provide a bar code reader for reading item packages.

We also prefer to provide a conveyor on which boxes, patient medication trays or drawers can be placed. The conveyor is positioned so that the picking means can place selected items into appropriate containers on the conveyor.

We provide a processing unit with associated memory and data entry peripherals. This computer system receives the list of requested items, directs the picking means, checks the items selected and prepares reports. Data can be entered manually through a keyboard or bar code reader or electronically through an RS 232 port. Reports may be printed, displayed on a console or transmitted to a memory or another computer for later use.

Other details and advantages of our method and apparatus will become apparent from the description of the preferred embodiments shown in the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings, the preferred embodiments of the invention and preferred methods of practicing the invention are illustrated in which:

FIG. 1 is a schematic representation of our present preferred system.

FIG. 2 is a side view of a present preferred package.

FIG. 3 is a perspective view of one present preferred storage rack.

FIG. 4 is a perspective view of a portion of a second preferred storage rack.

FIG. 5 is a perspective view of a portion of a third preferred storage rack.

FIG. 6 is a schematic representation showing the storage rack, conveyor and movable support structure which holds a gripper assembly.

FIG. 7 is a schematic view of a present preferred gripper assembly.

FIG. 8 is a front view of a present preferred gripper assembly.

FIG. 9 is a side view of the gripper assembly of

FIG. 7 with the storing rod in a raised and extended position.

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FIG. 10 is a side view of the gripper assembly of FIG. 8 with the storing rod in a lowered and partially retracted position.

FIG. 11 is a diagram showing a preferred vacuum and pressure line for the gripper assembly.

FIG. 12 is a schematic representation of the gripper assembly mounted on a vehicle.

FIG. 13 is a perspective view of a rod with packages thereon connected to a support bar.

FIG. 14 is a schematic representation of a side view of a first rod and a second rod and having packages thereon attached to a portion of the support bar.

FIG. 15 is a schematic overhead view of an alternative system for filling an order.

FIG. 16 is a flowchart of the filling process.

FIG. 17 is a flowchart of the check process.

FIG. 18 is a flowchart of the return process.

FIG. 19 is a flowchart of the restocking process.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings wherein like reference numerals refer to similar or identical parts throughout the several views, and more specifically to FIG. 1 thereof, there is shown a schematic representation of a present preferred system 10 for filling orders, such as prescriptions for patients. The system 10 contains storage racks 12 for handling packages. We prefer to provide at least two storage racks 12 and arrange them parallel to one another. Various storage rack designs can be used and certain present preferred storage racks are shown in FIGS. 3, 4 and 5. In our system, each package preferably contains only one product, although the product may consist of two or more related items, such as nut and bolt. When our system is installed in a hospital pharmacy, each package preferably contains a single dose of medicine.

A present preferred package 14 is illustrated in FIG. 2. Although the package could be a blister card or box, we prefer to use a clear plastic bag having a hole 15 to permit the package to be hung on a rod 30, 48, 65 or 66 shown in FIGS. 3, 6 and 14. Each package preferably has a bar code 16 and a written description 17, which identify the contents of the package. A white area 17a can be created on the clear plastic bag over which the written description 17 can be printed, stamped or even handwritten. The bar code and the written description may include not only the name of the product, but also its quantity, weight, instructions for use and expiration date. We also prefer to position the bar code and label on the package so that there is a large unmarked area 62 through which one can see the contents of the package. FIG. 2 represents a clear plastic bag for a unit dose of medicine. We can use a bag having a perforation line for easy opening or a recloseable bag having an interlocking rib type seal. The perforation line or rib seal is located along line 13. This type of bag is useful in a hospital pharmacy which buys medicines in large or bulk quantities and must repack the drugs in individual dose packages. Packages 14 can be any desired size. We have used a rectangular package having dimensions indicated by arrows A, B, C and D, wherein A is 3.5 inches, B is 1.0 inch, C is 3.0 inches and D is 0.1875 inches. Alternatively, the package 14 can have A equal 5.0 inches, B equal 1.25 inches, C equal 5.0 inches and D equal 0.1875 inches.

An individual dose of medicine can be manually fed into

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an automated packaging system 98, as shown in FIG. 1, which automatically seals the package and prints a bar code and typewritten label directly on the package. In a preferred embodiment, we utilize the H-100™ packaging system as manufactured by Automated packaging Systems of Twinsburg, Ohio. With the addition of the Accu-print™ 100 programmable In-Line Direct Transfer Imprinter, also manufactured by Automated packaging Systems, a bar code can be printed directly on the medicine package.

A storage rack 12, which may also be used for a supply station, is shown in FIG. 3. This rack is configured to hold packages of the type illustrated in FIG. 2. The rack has a rectangular frame 28, having an open front and back. Running across the back are a plurality of back rod supports 32 from which the rods 30 extend. The frame 28 with rod supports 32 forms an X, Y coordinate system with each rod 30 and medicine packages 14 therein having a unique X, Y coordinate. Packages are placed in the storage rack so that each product is located at a known X, Y coordinate. Since every product is in a known X, Y location, it is possible to direct an automatic picking means to any product location to select a desired item. The packages are segregated within the storage rack so that all packages in any given location have the same contents.

Although we prefer to use racks in which packages are hung on rods, other types of racks can be used for storage racks and supply stations in our system. In FIG. 4, we show the upper portion of a rack having a rectangular frame 21 with an open front and closed back 23. Attached to the back 23 are sets of brackets 25 positioned to hold packages 27. To be held securely in this rack, such packages must be fairly rigid. Blister cards and boxes can be used. If desired, a hole 15 could be provided in the packages to permit them to be carried on a rod.

A top portion of another suitable rack having a rectangular frame 21, open front and closed back 23 is shown in FIG. 5. This rack has a set of shelves 29, which may be inclined toward back 23. A set of dividers 31 separates groups of packages 27.

The racks of FIGS. 3, 4 and 5 have two important common features. First, the packages are held in locations having known X, Y coordinates. Those coordinates could be single X, Y values as may correspond to the position of the package holes 15 or a group of X, Y values defining an entire package. Second, there is sufficient clearance between packages to allow automated picking means to select, grab and replace individual packages.

Referring now to FIGS. 1 and 6, we provide storage racks 12 on either side of a track 42 over which a vehicle 44 may travel. The vehicle may be column-shaped as in FIG. 6. Many types of drive systems could be used to propel the vehicle. For example, one could provide a motor indicated by block 47 to propel wheels (not shown) at the base of the vehicle. Alternatively, one may use a chain or cable running through the track 42 to pull the vehicle to any desired location. Whatever drive system is used should be capable of moving the vehicle to positions along the track which correspond to the X coordinates of the packages within the rack. Thus, computer 24, which controls the drive system, can direct the vehicle 44 to a location in front of the package or packages to be selected.

Packages are selected by a picking means 38, preferably of the type illustrated in FIGS. 7 through 10. The picking means is mounted on column-shaped vehicle 44 in a manner to allow controlled vertical movement along that column. In this manner, the picking means 38 can be positioned at

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locations along column 44 which correspond to the Y coordinates of packages to be selected. The picking means 38 is controlled by a computer 24, or local area network of computers, having a database. The database has the order to be filled and a record of the predetermined locations 18 of each different product in the storage rack 12. The computer 24 guides the picking means 38 based on information contained in the database, such that the picking means 38 picks a package 14 according to the order to be filled. The picking means 38 can also include means, such as a bar code reader 26 as shown in FIG. 7, for determining the identity 16 of a package 14 in the storage rack 12 or in a supply rack 20 and providing its identity 16 to the computer 24. The computer 24 guides the picking means 38 to select the desired packages and deliver them to a desired location. In the system of FIGS. 1 and 6, the packages are delivered to containers 36 located on conveyor 34. When the system is installed in a hospital pharmacy, the containers 36 are individual patient boxes in which the patient's medication is delivered from the pharmacy to the appropriate floor or nurses' station. The patient boxes preferably are bar coded with a patient identification code. After a patient's prescription is filled and the patient box 36 has all the medicine packages called for in the prescription, a conveyor belt 34 moves the patient box 36 to a check station 80. An operator uses the check station bar code reader 82 to scan the bar code label on the filled patient box 36, see FIG. 15. The patient identification number is taken from the inputted bar code and the prescription of the patient is displayed on the check station screen 84 of the check station console 86 connected to the computer or network of computers 24. The operator then scans individual medicine package bar codes in the patient box 36. The identity of the medicine packages 14 in the patient box 36 is automatically checked for correctness with respect to the patient list on the station screen 84. If the medicine packages 14 in the box 36 are correct, then the patient box is allowed to continue on towards the ultimate destination and the next filled patient box 36 is then checked. If the medicine packages 14 in the patient box 36 are not correct, then it is determined whether the error, whatever that may be, can be corrected. If the correction can be made, then the record on the check station screen 84 is corrected and the procedure for verifying correctness is then repeated. If the problem cannot be corrected, then the patient box 36 can be manually filled or resubmitted to be filled with missing doses by the system and the computer is notified that the patient's prescription has not yet been filled.

In the event that a patient does not take all of the medicine which has been prescribed, unused medicine is returned to the hospital pharmacy in the patient box 36. Typically, patient boxes are transferred in a carrier which contains several patient boxes. This carrier is received at a return station 92. The patient box 36 is first removed from the carrier returned from a nursing unit. An operator uses the return station bar code scanner 91 to scan the bar code on the patient box 36. The nursing unit number and the patient identification number is then parsed from the inputted bar code of the patient box 36. The database is then accessed and the patient dispensing record is retrieved. On the return screen 94, there is displayed for a particular patient at the operator console 96, a list of the medicines ordered and dispensed to the patient. The operator of the return station 92 then scans the identity 16 of the medicine in the patient's box 36 with the return station bar code scanner 91. The medicine packages 14 that are found thereon are verified as being dispensed to the patients. The expiration date of the medicine in the medicine package 14 is then determined. If

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the expiration date of a medicine in the medicine package 14 has passed, then the medicine package is discarded. If the expiration date has not passed, then the returned medicine package 14 is placed in the supply rack 20. If there is more medicine to be returned, the process is then repeated. If there is no more medicine in the patient box 36 to return, then the return station console 96 is checked to verify the correctness of the medicine returned. If the screen is correct, then the return record is accepted and the database is updated. If the screen 94 is incorrect, then the screen is corrected to correspond to the returned medicine packages 14 and the patient box 36. In this manner, the system will have developed a record of all medication given to each patient. That record can be transferred to a hospital billing system and used for billing purposes. The data can also be input into an inventory monitoring system and used to generate reports or orders for new supplies.

We prefer to provide supply racks 20 which serve as a holding area for returned and new products. These racks are comparable to storage racks 12 and are accessed by the picking means 38 in the same manner. However, products are randomly placed in the supply racks either manually or by the picking means. The supply racks 20 are shown in FIG. 1 at a position where they are accessible to the picking means. However, we prefer that the supply rack be movable. Then it could be moved to other convenient locations, such as near packaging system 98 for refilling.

When packages 14 are to be restocked onto the storage racks 12, the supply rack 20 is placed in a predetermined position alongside the storage racks 12. By being placed in a predetermined position, the X and Y coordinates at which packages may have been placed in return racks 20 are known to the computer 24. Picking means 38 is then positioned for a given package in the return rack. The bar code reader 26 on the end of picking means 38 then scans the identity 16 of the package 14 that is about to be picked. The process of picking the returned packages 14 is the same as occurs with respect to the process of obtaining packages 14 from the storage rack 12. The only difference is that the order of the packages 14 and their identity as they are picked is saved in the computer 24. When the picking means is then moved to the storage racks 12 the computer knows the identity of the respective medicine package 14 on the picking means 38, which is about to be placed back onto the storage racks 12.

The picking means 38 includes at least one gripper assembly illustrated in FIGS. 7 through 12. As shown in FIG. 12, we prefer to provide a support bracket 41 extending from column 44. This bracket can move along column 44 in a vertical direction. A third actuator 43 is attached to bracket 41. Mounting 39 permits movement along rod 41 and movement at bar 43 in a direction normal to rod 41. A picking means 38, which preferably is the gripper assembly of FIGS. 7 through 10, is mounted to actuator 43 through actuator 45, which permits a 180-degree rotation of the gripper assembly. Actuator 43 permits horizontal movement of picking means 38 in the Z direction.

The gripper assembly is preferably comprised of a housing 49, as shown in FIG. 7 having means for storing medicine packages 14, such as a storing rod 48. Assembly 38 also contains means 50 for obtaining a package 14. The obtaining means 50 is slidably attached to the housing 49 such that it can move in a Z direction, which is perpendicular to the X, Y directions, to pick a package 14 from a support rod 30 in the storage rack 12 or supply rack 20. Identifying means, for example, the bar code reader 26 shown in FIG. 8, is mounted on housing 49 such that it can identify a package 14 to be picked by the obtaining means 50. The

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obtaining means 50 preferably includes means for producing a suction, such as a vacuum generator 58 controlled by a vacuum sensor 58a which draws a vacuum through vacuum line 55 and vacuum valve 54. The obtaining means 50 also preferably includes an extension rod 52 in fluidic communication with a pneumatic in/out cylinder 53 and associated valve 59, as shown in FIGS. 8 and 11. The extension rod 52 is slidably attached with respect to the Y and Z directions to the housing 49. A suction is maintained through the vacuum lines 55 when the vacuum valve 54 is activated to supply air to vacuum generator 48. The obtaining means 50 also can include a suction head 56 connected to the extension rod 52 through which a package is picked with suction. The vacuum sensor 58a will sense when a package is properly positioned on the suction head 56, for example, by detecting air flow therethrough. The suction head 56 and carried package are then moved to the storing means, such as the storing rod 48, to deposit the package thereon. Preferably, the storing means is a storing rod 48 which extends from the housing 49 such that the suction head 56 and the extension rod 52 can deposit a package 14 thereon. The obtaining means 49 is also composed of a cylinder 48A which allows an assembly of both holding rod 48 and pusher plate 57 to move in the Y direction. The holding rod 48 is also attached to a cylinder 48B which allows the storage rod to retract and extend in reference to the obtaining means. The pusher plate 57B is also attached to a cylinder 57A which allows the plate to move in the positive Z direction. This action is necessary to push drugs off of the storage bar 48 during the dump process.

The extension rod 52 can move in the Y and Z directions to place a picked package on the storing rod 48 under the action of up/down cylinder 51 and in/out cylinder 53. Valve 57 activates cylinder 51 to move both the cylinder 53 and the extension rod 52 in the Y direction. Valve 59 activates cylinder 53 to move the extension rod in the Z direction. Valve 54 provides air to the vacuum generator 58 to suction in head 56 sufficient to pick a package from a rod 30 of the support structure 28 and then hold it to the suction head 56. The suction head 56 preferably has two faces 60 and 61 through which suction can be drawn. One face 60 is capable of picking a package from a rod 30 of the storage rack and the other face 61 is capable of picking a package from a storing rod 48 of the picking means 38. As shown in FIG. 2, each package preferably has a face 62. The packages are held by the storing rod 48 and the rods 30 of the support structure 38 such that the face 62 of each package is parallel to the Y axis. The outside face 60 is utilized when a package 14 is being removed from a rod 30 in the supply rack, and the inside face 61 is utilized when a package is being removed from the storing rod 48 of the picking means 38.

In an alternative embodiment, the rods 30 extend from the double rod support bar 44 in sets of two as shown in FIG. 14. A first rod 65 and a second rod 66 of each set point essentially in the Z direction, but approximately 180 degrees apart from each other. This embodiment shown in FIG. 15 includes a first tooling support structure 70, a second tooling support structure 72, a first end of arm tooling 67 and a second end of arm tooling 68 that picks the packages 14. Each tooling support structure has at least one column type vehicle 44 and at least one track 42 to support the column 44. Column 44 moves along the respective tracks 42 to pick a given package 14 from a corresponding support rod 30, or restock a support rod 30 with an associated package 14.

In the operation of the preferred embodiment in a hospital, doctors visit patients in nursing units and write out medication orders for each patient. A patient is typically placed

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on a certain medication treatment which requires multiple doses of medication over a period of a day. Some medications are administered at certain times of the day and possibly at intervals of several hours. Patients may also request certain medications on an elective basis for disorders such as headaches. These requests are included in the doctor's order that is sent from the nursing unit to the central pharmacy of the hospital. Once an order is received by the pharmacy, it is checked by registered pharmacists and input into the pharmacy information system. These orders reflect not only orders that are added to a particular patient's treatment, but changes in the medication treatment. The pharmacy information system combines this information with the patient's existing medication schedule and develops a patient medication profile. A fill list is generated from that profile. The fill list is a list of all the medications that must be distributed to all patients for the day. This information is sent to the pharmacy printer where a hard copy is generated.

Means for communication between the pharmacy information system and the present system exist by either tapping the serial data print stream of the pharmacy information system or by a direct bi-directional communication link. The relevant information concerning the patient including drug type, dosage and frequency is placed in the database of the system. The database contains information about which drugs are to be dispensed that day to the patient and all drugs that have been dispensed in the past to the patient. Information from the pharmacy information system is received on an ongoing basis throughout the day. New information can be entered into the database at any time. In addition to the fill list, new orders and patient admittance, discharge and transfer information are received and stored.

FIG. 16 is a flowchart with respect to the processing of a patient prescription. A similar method would be followed for retrieving other stored products. The software for processing an order is started as indicated by box 180. Then the steps indicated by boxes 181 thru 282 are followed. Before a box is loaded onto the conveyers, the operator scans the location barcode and the patient barcode on the patient box. The system then checks its database to ensure that that patient is still at that location. If a new patient has been transferred or admitted to that location, the system automatically generates a barcode label with that patient's identification number on it. This label is then manually applied to the patient box and the box is placed on the conveyor. If no patient is registered in the room, the box is placed aside and the operator proceeds with the next patient box to be filled. When the turn comes for the patient box 36 to be filled, it is shuttled into a position on the conveyor 34 such that the gripper assembly 38 can communicate with the box 36 as shown in FIG. 1. A stationary bar code reader 90 reads the bar code on the patient box 36. The patient identification number is then parsed from the bar code input. This causes the fill list for that particular patient to be retrieved from the database as indicated in box 185. The fill list is converted to data consisting of locations and number of picks. At box 187 the data is then downloaded to a robot controller or gantry control program in order for the computer 24 to control the end of arm tooling 38 such that it knows what packages 14 to obtain and place in the patient box 36.

The system is now ready to pick the drugs 188. First, the column-type vehicle 44 goes to the rack where the drug to be selected is stored and stops at the X coordinate of that drug package. The picking means 38 then moves along the column 44 to the Y coordinate of the medicine package to be picked. It is also turned to the proper storage rack 12 which has the desired package 14. These actions may also be

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performed simultaneously by the system 189.

When the end of gripper assembly 38 is properly positioned, the bar code reader 26 reads 190 the identity 16 on the medicine package 14 in order to confirm that it is the proper medicine package to be picked with respect to the patient's prescription. After such confirmation the suction rod 52 extends in the Z direction by pneumatic cylinder 53 such that the outside suction face 60 contacts the package face 62. Valve 54 activates a suction through the air lines 55 such that a suction drawn through the suction face 60 grabs the medicine package 14 sensor 58a detects when the contact is proper between the suction face 60 and the medicine package 14, as indicated at box 192 of FIG. 16. Then the extension rod 52 retracts from the rod 30 of the support structure 28, pulling the medicine package 14 with it. Once the medicine package 14 is clear of the rod 30, the extension rod 52 positions the medicine package 14 that it has obtained, upon the storing rod 48 as indicated by box 193.

The system now prepares for the next pick. This operation is indicated by box 194 includes several actions. Once the package 14 is on the storage rod 48, the vacuum valve 54 terminates the suction and the medicine package is released from the suction face 60. The vacuum valve 57 then activates the cylinder 51 such that the extension rod 52 (and cylinder 53) are moved in the Y direction so the bottom of the suction head 56 is above the package 14 on the storing rod 48. The extension rod is then moved forward in the Z direction and downward in the Y direction by the respective valves and cylinders to clear the package and position the suction head 56 for the next pick. In an alternative embodiment the storage rod 48 is moved down rather than moving suction head up 56 to provide clearance between them when the suction head moves in a Z direction. The computer 24 then notes that the medicine package 14 with the appropriate medicine has been picked.

The final series of operations indicated by boxes 195 thru 202 involves a comparison of the drug identified by the reader as having been picked with the list of drugs to be selected. If an incorrect drug was selected the gripper assembly moves to a reject area, places the incorrect drug there, removes that drug from the list of items selected and is ready to pick more drugs. If the correct drug was selected the system records that fact and is ready to pick more drugs. The process is repeated for all the medicine identified in the patient's prescription until all of the medicine packages 14 needed have been picked.

The gripper assembly containing all desired packages then positions itself so that it is over the patient box 36. The gripper assembly 38 then positions the outside suction face 60 behind the medicine packages on the storing rod 48 that have been collected. Packages can be dropped into the patient box by retracting rod 48 by actuating cylinder 48A to the position shown in FIG. 10. The storage rod 48 is then moved into the negative Z direction so that the suction face no longer holds the packages in place. The cylinder 48B then causes the storage rod 48 to be retracted which will cause the drugs to be dumped into the box.

Alternatively, the suction head may be stroked forward in the Z direction so that all packages 14 are pushed off the storing rod 48 into the patient box 36. Movement of the suction head is accomplished by the vacuum system. Vacuum valve 57 activates the cylinder 51 to retract in the positive Y direction such that the bottom of the suction head 56 is above the tops of the packages 14 on the storing rod 28. Then vacuum valve 59 activates cylinder 53 to retract the

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extension rod 52 in the negative Z direction such that the outer suction face 60 is behind all of the medicine packages 14 on the storing rod 48. Vacuum valve 57 is then activated such that the suction head 56 is dropped back down in the negative Y direction to be behind the packages 14. Finally, vacuum valve 59 is activated such that the extension rod 52 is extended in the positive Z direction and the front suction face 60 pushes all packages 14 off the storing rod 48 into the patient box 36.

In the event that the wrong medicine package 14 was scanned and is picked, or the medicine has expired, then picking means 38 will have placed those packages in a reject or return area, where the medicine package 14 can be disposed. A pharmacy technician will then manually sort the drugs in the reject area, removing expired drugs and placing the others in the supply rack in order that they might be returned to their correct location in the system. The process is then repeated for the next drug on the prescription list that has not yet been obtained.

The flow chart of FIG. 17 is the process of checking the selected packages which have been placed in a patient box. Such checking is performed at the check station. The process begins by calling up the check program indicated by box 105. The bar code on the patient box is scanned 106 and the patient number portion of the bar code is identified 107. The patient number is displayed 108 on the screen at the check station. Then the packages in the patient box are scanned 109. The identification of the packages is compared with the list of drugs that had been ordered for the patient in a verify step 110. If correct packages are in the box, the checking of the box is complete and the system is ready for the next box 111. If the packages in the box do not match the order the system determines if the problem can be corrected 112. If so, the correction is made 113 and the verify step is repeated. If not, the box is dumped 114 and the order is recorded as not filled or the box is resubmitted and the missing medications are filled by the system. For example, should the system determine that an item is missing it may either create a modified list and send the box on with a modified list or it may instruct the picking means to get the missing item.

The return process is shown in the flow chart of FIG. 18. The process starts 115 by calling up the return program. The patient box containing the returned items must be positioned so that the patient box can be scanned 116 for the patient identification number 117 and the nursing unit from which the box was returned. If the box has come from the proper nursing unit the system retrieves the patient dispensing record 120 and displays that record 121 for the operator. Next the packages are scanned 122. The system preferably verifies 123 that the scanned packages had been sent to the patient making the return. Next the system checks each package 124 to determine if the drug is useful or if it has expired, been recalled or otherwise should not be returned to the supply rack. If no, the package is discarded 125. If yes, the package is returned to the supply rack 126. If more drugs remain in the box the process is repeated 127. If no packages remain, the system may further process the list of returned packages 128 to modify the patient's record, update the system inventory log or display the list of returns for review by the operator.

The process of restocking returned or new packages to the storage rack is diagramed in FIG. 19. These packages are manually placed on a return or supply rack and the program for restocking is called up 130. The program causes the picking means to be positioned 131 so that the gripping assembly can pick packages from the return or supply rack. The bar code on the first package is scanned 132 and the

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portion of the scanned bar code which identifies the drug is found 133. The system then checks the database 134 for the location in the storage rack which has been designated for the identified product. The system extends the vacuum head 135 to engage the package. Suction is applied 136 and a suction sensor is checked. This should cause the package to be held by the gripper assembly which fact will be confirmed by the sensor 137. The gripper assembly positions the package 138 on the storage rod 48 in the gripper assembly. Then the suction is released and the gripper assembly is ready to place additional packages on the storage rod. If more packages remain on the return or supply rack 140, the process is repeated until all packages are on the storage rod or the storage rod is full. The gripper assembly is then moved to a position 141 in front of the storage rack to properly place the outermost package on the storage rod. That package is grasped 142 using back suction cups 61 (see FIG. 11). The extension rod 52 is retracted in the negative Z direction such that the inside suction face 61 is in contact with the medicine package 14. The sensing means 58 determines whether proper contact is made. Then the extension rod 52 is moved a predetermined distance in the positive Z direction 143 to place the medicine package over a rod 30 of support structure 28. Vacuum valve 54 is then deactivated 144 to stop suction, allowing the medicine package 14 on the suction face 61 to drop away therefrom. The extension rod 52 then moves in the negative Z direction towards the medicine packages 14 on the storing rod 48 to repeat the process. While it moves back to obtain another medicine package 14, the sensor 58 trips when contact is made. The process can be repeated 141 until there are no more medicine packages 14 on the storing rod 48. The computer 24 knows when to stop returning packages since it knew how many packages had been placed on the storing rod 48.

In the event that all drugs to be returned or restocked at a particular storage location are identical the process is some what different. Packages are picked from the supply rack in the method detailed above. The gripper assembly is then moved to a position in front of the storage rack to place the remaining packages on the storage rod. Cylinder 48A causes the assembly of storing rod 48 and pusher plate 57B to move in the negative Z direction. Storing rod 48 is co-linear with a rod 30 of support structure 28. Pusher plate 57B then moves in the positive Z direction pushing all remaining packages on storage rod 48 on to rod 30.

The restocking of the storage racks 12 can be carried out during the evening when packages are not being gathered to fill orders. Alternatively, restocking can be carried out simultaneously with picking if the system 10 has a pair of rods as shown in FIG. 14, a first end of arm tooling 67, second end of arm tooling 68 and a first tooling structure 70 and a second tooling structure 72 is utilized, as shown in FIG. 15. While, for instance, the first end of arm tooling 67 is picking medicine packages 14 to fill a patient's prescription, the second end of arm tooling 68 can be restocking the second side of the storage area 12.

Although the invention has been described in detail in the foregoing embodiments for the purpose of illustration, it is to be understood that such detail is solely for that purpose and that variations can be made therein by those skilled in the art without departing from the spirit and scope of the invention except as it may be described by the following claims.

We claim:

1. A system for selecting and delivering packages to fill orders comprising:

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- a) a storage area comprised of a plurality of storage area locations each location having package holding means sized and configured to hold a plurality of individual packages each individual package having a machine readable label which identifies a type of package, the packages being held in a manner so that each package can be placed into and removed from the storage area locations and so that the machine readable label on at least one package in a storage location can be read without removing the package from the storage location, each location having a distinct x, y coordinate;
- b) automated picking means sized and configured to be able to hold packages, to select packages from the storage area locations and place packages in the storage area locations in accordance with computer controlled instructions, the picking means having a gripper for grasping and moving the packages and having a picking means storage location sized and configured to hold a plurality of packages in a face to face relationship after the plurality of packages have been retrieved from the storage area and prior to delivery of the plurality of packages to a desired destination separate from the picking means;
- c) means for moving the automated picking means to selected storage locations;
- d) a computer having at least one memory which contains a program for directing the picking means to chosen storage area locations and a database containing at least one x, y coordinate location in the storage area for each package held within the storage area the computer being connected to the automated picking means and the means for moving the automated picking means; and
- e) a package reader associated with the picking means and being positioned for reading the machine readable labels on packages located within the storage area, wherein only one type of package is stored in each x, y coordinate location.
2. The system of claim 1 wherein the gripper is a vacuum bead.
3. The system of claim 1 also comprising a sensor attached to the picking means for determining when the package is grasped by the gripper.
4. The system of claim 1 wherein the label is a bar code and the reader is a bar code reader.
5. The system of claim 1 wherein the label also contains an expiration date.
6. The system of claim 1 wherein the picking means contains a picking means storage area for holding the plurality of packages selected by the picking means.
7. The system of claim 6 wherein the picking means storage area is comprised of at least one storage rod and holes are provided in the packages to permit the packages to be held on the storage rod.
8. The system of claim 1 also comprising a supply station for receiving new and returned packages, the supply station having a plurality of locations each location having package holding means sized and configured to hold at least one package in a manner so that the package can be placed into

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and removed from the locations by the automated picking means, each location having a distinct x, y coordinate.

9. The system of claim 8 also comprising means for moving the supply station wherein the supply station is removably positioned adjacent the storage area.

10. The system of claim 1 wherein the package holding means in the storage area is comprised of a plurality of rods and a hole is provided in each package to permit the package to be held on the rods.

11. The system of claim 1 also comprising at least one data transmission port attached to the computer through which a list of packages to be selected can be input and a list of packages selected by the system can be output.

12. The system of claim 1 wherein the memory contains a program for checking comparability of products in packages selected by the picking means with other products listed in the database.

13. The system of claim 1 also comprising a conveyor positioned to receive packages from the picking means.

14. The system of claim 13 also comprising a plurality of containers positioned on the conveyor, the containers being sized and positioned to receive packages from the picking means.

15. The system of claim 14 wherein the containers have machine readable labels.

16. The system of claim 15 wherein the labels are bar codes.

17. The system of claim 14 wherein the labels are bar codes.

18. The system of claim 14 also comprising a check station located adjacent the conveyor, the check station having reading means for reading the machine readable labels.

19. The system of claim 18 wherein the reading means is connected to the computer in a manner to input information from the machine readable labels; the computer having a program for storing the input information in the memory and for comparing the input information to other information contained in the database.

20. A system as described in claim 18 wherein the picking means includes at least one gripper that picks the packages; and a tooling support structure having at least one column to support the tooling and at least one row to support the column such that the tooling means moves along the column as the column moves along the row to pick a given package hanging from a corresponding support rod, said gripper able to turn at least 180° on the column to pick packages from either the first or from selected storage locations which locations are positioned opposite and facing one another; and means for moving the column with respect to the row, said moving means controlled by the computer and in communication therewith.

21. The system of claim 1 wherein the packages contain individual doses of medicine.

22. The system of claim 1 also comprising a track over which the picking means travels according to directions supplied by the computer also comprising means for moving the picking means over the track.

* * * * *

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TITLE	AUTOMATED SYSTEM FOR SELECTING AND DELIVERING PACKAGES FROM A STORAGE AREA						
This is to certify that annexed hereto is a true copy from the records of the United States Patent and Trademark Office of the application as filed which is identified above.							
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Date				Certifying Officer			

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THE COMMISSIONER OF PATENTS AND TRADEMARKS
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Sir:

Transmitted herewith for filing is the patent application of

Inventor: Sean C. McDonald et al.

For: AN AUTOMATED SYSTEM FOR SELECTING AND DELIVERING PACKAGES FROM A STORAGE AREA

(Cont.-in-part of Serial No. 469,217, filed January 24, 1990)

Enclosed are:

- ☒ 19 sheets of drawings
- ☐ An assignment of the invention
- ☐ A certified copy of a _____ application
- ☐ An associate power of attorney.
- ☒ A verified statement to establish small entity status under 37 CFR 1.9 and 37 CFR 1.27.

The filing fee has been calculated as shown below:

	(Col. 1)	(Col. 2)	SMALL ENTITY		OTHER THAN A SMALL ENTITY
FOR:	NO. FILED	NO. EXTRA	RATE	FEE	OR RATE FEE
BASIC FEE				\$345	OR \$690
TOTAL CLAIMS	36 - 20 =	16	x 10 =	\$160	OR x 20 = \$
INDEP CLAIMS	2 - 3 =	0	x 36 =	\$	OR x 72 = \$
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENTED			+ 110 =	\$	OR + 220 = \$
			TOTAL	\$ 505	\$

*If the difference in Col. 1 is less than zero, enter "0" in Col. 2

- ☐ Please charge my Deposit Account No. 02-4553 the amount of \$ _____. A duplicate copy of this sheet is enclosed.
- ☒ A check in the amount of \$ 505.00 to cover the filing fee is enclosed.
- ☒ The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 02-4553. A duplicate copy of this sheet is enclosed.
- ☒ Any additional filing fees required under 37 CFR 1.16.
- ☐ Any patent application processing fees under 37 CFR 1.17.
- ☐ The Commissioner is hereby authorized to charge payment of the following fees during the pendency of this application or credit any overpayment to Deposit Account No. 02-4553. A duplicate copy of this sheet is enclosed.
- ☐ Any patent application processing fees under 37 CFR 1.17.
- ☐ The issue fee set in 37 CFR 1.18 at or before mailing of the Notice of Allowance, pursuant to 37 CFR 1.311(b).
- ☐ Any filing fees under 37 CFR 1.16 for presentation of extra claims.

Respectfully submitted,

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TITLE

AN AUTOMATED SYSTEM FOR SELECTING
AND DELIVERING PACKAGES FROM A STORAGE AREA

Related Application

continuation of Sn 07/871832 filed 4/21/92, now abandoned which is a
This is a continuation-in-part of our United States
now abandoned
patent application Serial No. 07/469,217 filed January 24, 1990.

FIELD OF THE INVENTION

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The present invention relates to an automated system for selecting stored articles. More specifically, the present invention relates to an automated system for filling prescriptions and restocking medicines in a pharmacy.

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BACKGROUND OF THE INVENTION

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Many industries store products or parts in a storeroom or storage area and repeatedly select some of the stored items to fill orders or for other uses. Such items may range from small electronic components used by a manufacturer of electronic devices to automotive parts, which vary in size, used by service departments of automobile dealerships. Usually one or more people are employed to retrieve the requested items and to restock new and returned items. These individuals may also be required to confirm that the requested items are compatible with

one another and with previously supplied items. If the supplied items are to be billed to a customer or charged to particular internal accounts, the list of items is first written by the requestor, and rewritten or entered into a computer database by the storeroom attendant to create an invoice, supply list or other document. In some instances, further generations of the list are made by installers, users or billing clerks. Such methods have built-in opportunities for mistakes every time a list is rewritten and are less efficient than automated systems. Moreover, as labor costs rise and the size of inventory needed to be stored expands, the conventional storeroom and parts department become more and more expensive.

Some businesses have attempted to control costs by limiting inventory through standardization of parts. But such limits are not possible or desirable in some industries, particularly in a hospital pharmacy.

Currently, in large hospital environments, doctors visit patients in nursing units and write out medication orders for each patient. A patient is typically placed on a certain medication which may require multiple doses of medication be administered over a period of a day. Some medications are administered at certain times of the day and possibly at intervals of several hours. Patients may also request certain medications on an elective basis for disorders such as headaches. These requests are included in the doctor's order that is sent from the nursing unit to the central pharmacy of the hospital.

Once an order is received by the pharmacy, it is checked by registered pharmacists and input into the pharmacy information system. These orders reflect not only orders that are added to a particular patient's treatment, but changes in the medication treatment. The pharmacy information system combines this information with the patient's existing medication schedule and develops a patient medication profile. A fill list is generated from that profile. The fill list is a list of all the medications that must be distributed to all patients for the day. This information is sent to the pharmacy printer where a hard copy is generated. Frequently, that hard copy or a copy thereof is sent to the billing department so that the medication can be charged to the patient or his insurer.

At this point, the drugs for a particular patient are hand-picked by either a pharmacist or a pharmacy technician and placed in the particular patient's designated box. A registered pharmacist must then check the accuracy of the patient order before it leaves the pharmacy. Individual patient boxes are then loaded into a large cassette and delivered to the nursing unit.

Approximately 30% of the drugs dispensed each day are returned to the pharmacy unused. Since each drug is individually packaged, the drugs must be returned to the pharmacy stock. Patients are then credited for unused medication. This return and crediting process is a very time-consuming task and requires significant amount of pharmacy manpower.

In a typical large pharmacy, up to 35 pharmacists and pharmacy technicians are responsible for all aspects of the unit dose dispensing task. Because this process is done manually, a certain amount of error occurs. Studies have estimated that a half-percent error rate is typical in a large hospital. Since a hospital may dispense over 6,000 doses each day, this error rate leads to a significant number of missed or incorrect doses.

Several companies have tried to automate this process through various approaches to the problem. Meditrol utilizes a vending machine approach to dispense the unit dose medications. Each nursing unit must have its own stock of prescription drugs. Nurses key in a patient ID and the drugs for that patient are then dispensed from the vending machine. This system is very expensive because of the necessity of purchasing a machine for each nursing unit. Also, restocking each machine is a very time-consuming task. Implementation of this system requires a complete modification of the current drug dispensing process which many hospitals are reticent to undertake. The system claims no labor-saving advantages from its implementation. This system is covered under United States Patent No. 3,917,045 titled "Drug Dispensing Apparatus" and dated November 11, 1975.

Baxter Travenol offers a dispensing system from Samsung, a Korean company, which dispenses bulk solids into a package which is dispensed to the pharmacist. This system only dispenses the 200 most frequently used solids. A typical hospital pharmacy can contain over 1,500 different medications, many in liquid,

syringe or bottle form. These medications cannot be automatically dispensed by this system, but must be manually selected by the pharmacist.

Neither system allows the dispensed medications to be
5 automatically returned to the storage area.

There is a need for an automated system which is able to dispense all dosage forms currently contained in a hospital pharmacy. Medicines should be automatically dispensed by the system per a patient order and placed in individual patient
10 medication boxes for a pharmacist to check. Each drug and each patient box should be individually bar coded so that the accuracy of the dispensing process can be automatically checked by the system. Once drugs are returned to the pharmacy, the system should automatically return each drug to its proper location in
15 inventory and credit the patient's account for the return. One system should also keep a running inventory and notify the user whenever inventory of a particular item drops below a preset level and whether the shelf life of an item has passed. With such a system, a hospital can recognize significant labor
20 savings, as well as savings based on improved accuracy in the dispensing function and better tracking of inventory and expired medications.

SUMMARY OF THE INVENTION

We provide an automated method and apparatus for selecting and restocking stored items, which is particularly
5 useful for filling patient medication orders in a hospital pharmacy. The stored items must be packaged to be held in a storage rack. Preferably, each package contains a bar code corresponding to the package contents. The items are arranged in
10 a main storage rack so that like items are in the same location and a predetermined location is provided for every item.

We prefer to provide a second rack or a designated portion of the main storage rack for receipt of new or returned items to be restocked. Such items can be randomly placed on this supply station for transmittal to their respective predetermined
15 locations on the storage rack.

We also provide a means for picking items from and placing items in the storage rack and the supply station. The picking means preferably is comprised of a gripper assembly mounted on a transport vehicle which moves along a track or other
20 controlled route. The gripper assembly preferably has a movable rod or other carrier for holding selected items, at least one vacuum head and associated controls for gripping and moving selected items. We prefer to provide a bar code reader for reading item packages.

25 We also prefer to provide a conveyor on which boxes, patient medication trays or drawers can be placed. The conveyor

is positioned so that the picking means can place selected items into appropriate containers on the conveyor.

We provide a processing unit with associated memory and data entry peripherals. This computer system receives the list of requested items, directs the picking means, checks the items selected and prepares reports. Data can be entered manually through a keyboard or bar code reader or electronically through an RS 232 port. Reports may be printed, displayed on a console or transmitted to a memory or another computer for later use.

Other details and advantages of our method and apparatus will become apparent from the description of the preferred embodiments shown in the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings, the preferred embodiments of the invention and preferred methods of practicing the invention are illustrated in which:

Figure 1 is a schematic representation of our present preferred system.

Figure 2 is a side view of a present preferred package.

Figure 3 is a perspective view of one present preferred storage rack.

Figure 4 is a perspective view of a portion of a second preferred storage rack.

Figure 5 is a perspective view of a portion of a third preferred storage rack.

Figure 6 is a schematic representation showing the storage rack, conveyor and movable support structure which holds a gripper assembly.

Figure 7 is a schematic view of a present preferred gripper assembly.

Figure 8 is a front view of a present preferred gripper assembly.

Figure 9 is a side view of the gripper assembly of Figure 7 with the storing rod in a raised and extended position.

Figure 10 is a side view of the gripper assembly of Figure 8 with the storing rod in a lowered and partially retracted position.

Figure 11 is a diagram showing a preferred vacuum and pressure line for the gripper assembly.

Figure 12 is a schematic representation of the gripper assembly mounted on a vehicle.

Figure 13 is a perspective view of a rod with packages thereon connected to a support bar.

Figure 14 is a schematic representation of a side view of a first rod and a second rod and having packages thereon attached to a portion of the support bar.

Figure 15 is a schematic overhead view of an alternative system for filling an order.

Figure 16 is a flowchart of the filling process.

Figure 17 is a flowchart of the check process.

Figure 18 is a flowchart of the return process.

Figure 19 is a flowchart of the restocking process.

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DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings wherein like reference numerals refer to similar or identical parts throughout the several views, and more specifically to Figure 1 thereof, there is shown a schematic representation of a present preferred system 10 for filling orders, such as prescriptions for patients. The system 10 contains storage racks 12 for handling packages. We prefer to provide at least two storage racks 12 and arrange them parallel to one another. Various storage rack designs can be used and certain present preferred storage racks are shown in Figures 3, 4 and 5. In our system, each package preferably contains only one product, although the product may consist of two or more related items, such as nut and bolt. When our system is installed in a hospital pharmacy, each package preferably contains a single dose of medicine.

A present preferred package 14 is illustrated in Figure 2. Although the package could be a blister card or box, we prefer to use a clear plastic bag having a hole 15 to permit the package to be hung on a rod 30, 48, 65 or 66 shown in Figures 3, 6 and 14. Each package preferably has a bar code 16 and a written description 17, which identify the contents of the

package. A white area 17a can be created on the clear plastic bag over which the written description 17 can be printed, stamped or even handwritten. The bar code and the written description may include not only the name of the product, but also its
5 quantity, weight, instructions for use and expiration date. We also prefer to position the bar code and label on the package so that there is a large unmarked area 62 through which one can see the contents of the package. Figure 2 represents a clear plastic bag for a unit dose of medicine. We can use a bag having a
10 perforation line for easy opening or a recloseable bag having an interlocking rib type seal. The perforation line or rib seal is located along line 13. This type of bag is useful in a hospital pharmacy which buys medicines in large or bulk quantities and must repackage the drugs in individual dose packages. Package 14
15 can be any desired size. We have used a rectangular package having dimensions indicated by arrows A, B, C and D, wherein A is 3.5 inches, B is 1.0 inch, C is 3.0 inches and D is 0.1875 inches. Alternatively, the package 14 can have A equal 5.0 inches, B equal 1.25 inches, C equal 5.0 inches and D equal
20 0.1875 inches.

An individual dose of medicine can be manually fed into an automated packaging system 98, as shown in Figure 1, which automatically seals the package and prints a bar code and typewritten label directly on the package. In a preferred
25 embodiment, we utilize the H-100™ packaging system as manufactured by Automated Packaging Systems of Twinsburg, Ohio.

With the addition of the Accu-Print™ 100 Programmable In-Line Direct Transfer Imprinter, also manufactured by Automated Packaging Systems, a bar code can be printed directly on the medicine package.

5 A storage rack 12, which may also be used for a supply station, is shown in Figure 3. This rack is configured to hold packages of the type illustrated in Figure 2. The rack has a rectangular frame 28, having an open front and back. Running across the back are a plurality of back rod supports 32 from
10 which the rods 30 extend. The frame 28 with rod supports 32 forms an X, Y coordinate system with each rod 30 and medicine packages 14 therein having a unique X, Y coordinate. Packages are placed in the storage rack so that each product is located at a known X, Y coordinate. Since every product is in a known X, Y
15 location, it is possible to direct an automatic picking means to any product location to select a desired item. The packages are segregated within the storage rack so that all packages in any given location have the same contents.

 Although we prefer to use racks in which packages are
20 hung on rods, other types of racks can be used for storage racks and supply stations in our system. In Figure 4, we show the upper portion of a rack having a rectangular frame 21 with an open front and closed back 23. Attached to the back 23 are sets of brackets 25 positioned to hold packages 27. To be held
25 securely in this rack, such packages must be fairly rigid. Blister cards and boxes can be used. If desired, a hole 15 could

be provided in the packages to permit them to be carried on a rod.

A top portion of another suitable rack having a rectangular frame 21, open front and closed back 23 is shown in Figure 5. This rack has a set of shelves 29, which may be inclined toward back 23. A set of dividers 31 separates groups of packages 27.

The racks of Figures 3, 4 and 5 have two important common features. First, the packages are held in locations having known X, Y coordinates. Those coordinates could be single X, Y values as may correspond to the position of the package holes 15 or a group of X, Y values defining an entire package. Second, there is sufficient clearance between packages to allow automated picking means to select, grab and replace individual packages.

Referring now to Figures 1 and 6, we provide storage racks 12 on either side of a track 42 over which a vehicle 44 may travel. The vehicle may be column-shaped as in Figure 6. Many types of drive systems could be used to propel the vehicle. For example, one could provide a motor indicated by block 47 to propel wheels (not shown) at the base of the vehicle. Alternatively, one may use a chain or cable running through the track 42 to pull the vehicle to any desired location. Whatever drive system is used should be capable of moving the vehicle to positions along the track which correspond to the X coordinates of the packages within the rack. Thus, computer 24, which

controls the drive system, can direct the vehicle 44 to a location in front of the package or packages to be selected.

Packages are selected by a picking means 38, preferably of the type illustrated in Figures 7 through 10. The picking means is mounted on column-shaped vehicle 44 in a manner to allow controlled vertical movement along that column. In this manner, the picking means 38 can be positioned at locations along column 44 which correspond to the Y coordinates of packages to be selected. The picking means 38 is controlled by a computer 24, or local area network of computers, having a database. The database has the order to be filled and a record of the predetermined locations 18 of each different product in the storage rack 12. The computer 24 guides the picking means 38 based on information contained in the database, such that the picking means 38 picks a package 14 according to the order to be filled. The picking means 38 can also include means, such as a bar code reader 26 as shown in Figure 7, for determining the identity 16 of a package 14 in the storage rack 12 or in a supply rack 20 and providing its identity 16 to the computer 24. The computer 24 guides the picking means 38 to select the desired packages and deliver them to a desired location. In the system of Figures 1 and 6, the packages are delivered to containers 36 located on conveyor 34. When the system is installed in a hospital pharmacy, the containers 36 are individual patient boxes in which the patient's medication is delivered from the pharmacy to the appropriate floor or nurses' station. The patient boxes

preferably are bar coded with a patient identification code.

After a patient's prescription is filled and the patient box 36 has all the medicine packages called for in the prescription, a conveyor belt 34 moves the patient box 36 to a check station 80.

5 An operator uses the check station bar code reader 82 to scan the bar code label on the filled patient box 36, see Figure 15. The patient identification number is taken from the inputted bar code and the prescription of the patient is displayed on the check station screen 84 of the check station console 86 connected to
10 the computer or network of computers 24. The operator then scans individual medicine package bar codes in the patient box 36. The identity of the medicine packages 14 in the patient box 36 is automatically checked for correctness with respect to the patient list on the station screen 84. If the medicine packages 14 in
15 the box 36 are correct, then the patient box is allowed to continue on towards the ultimate destination and the next filled patient box 36 is then checked. If the medicine packages 14 in the patient box 36 are not correct, then it is determined whether the error, whatever that may be, can be corrected. If the
20 correction can be made, then the record on the check station screen 84 is corrected and the procedure for verifying correctness is then repeated. If the problem cannot be corrected, then the patient box 36 can be manually filled or resubmitted to be filled with missing doses by the system and the
25 computer is notified that the patient's prescription has not yet been filled.

In the event that a patient does not take all of the medicine which has been prescribed, unused medicine is returned to the hospital pharmacy in the patient box 36. Typically, patient boxes are transferred in a carrier which contains several patient boxes. This carrier is received at a return station 92. The patient box 36 is first removed from the carrier returned from a nursing unit. An operator uses the return station bar code scanner 91 to scan the bar code on the patient box 36. The nursing unit number and the patient identification number is then parsed from the inputted bar code of the patient box 36. The database is then accessed and the patient dispensing record is retrieved. On the return screen 94, there is displayed for a particular patient at the operator console 96, a list of the medicines ordered and dispensed to the patient. The operator of the return station 92 then scans the identity 16 of the medicine in the patient's box 36 with the return station bar code scanner 91. The medicine packages 14 that are found thereon are verified as being dispensed to the patients. The expiration date of the medicine in the medicine package 14 is then determined. If the expiration date of a medicine in the medicine package 14 has passed, then the medicine package is discarded. If the expiration date has not passed, then the returned medicine package 14 is placed in the supply rack 20. If there is more medicine to be returned, the process is then repeated. If there is no more medicine in the patient box 36 to return, then the return station console 96 is checked to verify the correctness of

the medicine returned. If the screen is correct, then the return record is accepted and the database is updated. If the screen 94 is incorrect, then the screen is corrected to correspond to the returned medicine packages 14 and the patient box 36. In this manner, the system will have developed a record of all medication given to each patient. That record can be transferred to a hospital billing system and used for billing purposes. The data can also be input into an inventory monitoring system and used to generate reports or orders for new supplies.

We prefer to provide supply racks 20 which serve as a holding area for returned and new products. These racks are comparable to storage racks 12 and are accessed by the picking means 38 in the same manner. However, products are randomly placed in the supply racks either manually or by the picking means. The supply racks 20 are shown in Figure 1 at a position where they are accessible to the picking means. However, we prefer that the supply rack be movable. Then it could be moved to other convenient locations, such as near packaging system 98 for refilling.

When packages 14 are to be restocked onto the storage racks 12, the supply rack 20 is placed in a predetermined position alongside the storage racks 12. By being placed in a predetermined position, the X and Y coordinates at which packages may have been placed in return racks 20 are known to the computer 24. Picking means 38 is then positioned for a given package in the return rack. The bar code reader 26 on the end of picking

means 38 then scans the identity 16 of the package 14 that is about to be picked. The process of picking the returned packages 14 is the same as occurs with respect to the process of obtaining packages 14 from the storage rack 12. The only difference is
5 that the order of the packages 14 and their identity as they are picked is saved in the computer 24. When the picking means is then moved to the storage racks 12 the computer knows the identity of the respective medicine package 14 on the picking means 38, which is about to be placed back onto the storage racks
10 12.

The picking means 38 includes at least one gripper assembly illustrated in Figures 7 through 12. As shown in Figure 12, we prefer to provide a support bracket 41 extending from column 44. This bracket can move along column 44 in a vertical
15 direction. A third actuator 43 is attached to bracket 41. Mounting 39 permits movement along rod 41 and movement at bar 43 in a direction normal to rod 41. A picking means 38, which preferably is the gripper assembly of Figures 7 through 10, is mounted to actuator 43 through actuator 45, which permits a
20 180-degree rotation of the gripper assembly. Actuator 43 permits horizontal movement of picking means 38 in the Z direction.

The gripper assembly is preferably comprised of a housing 49, as shown in Figure 7 having means for storing medicine packages 14, such as a storing rod 48. Assembly 38 also
25 contains means 50 for obtaining a package 14. The obtaining means 50 is slidably attached to the housing 49 such that it can

move in a Z direction, which is perpendicular to the X, Y directions, to pick a package 14 from a support rod 30 in the storage rack 12 or supply rack 20. Identifying means, for example, the bar code reader 26 shown in Figure 8, is mounted on housing 49 such that it can identify a package 14 to be picked by the obtaining means 50. The obtaining means 50 preferably includes means for producing a suction, such as a vacuum generator 58 controlled by a vacuum sensor 58a which draws a vacuum through vacuum line 55 and vacuum valve 54. The obtaining means 50 also preferably includes an extension rod 52 in fluidic communication with a pneumatic in/out cylinder 53 and associated valve 59, as shown in Figures 8 and 11. The extension rod 52 is slidably attached with respect to the Y and Z directions to the housing 49. A suction is maintained through the vacuum lines 55 when the vacuum valve 54 is activated to supply air to vacuum generator 48. The obtaining means 50 also can include a suction head 56 connected to the extension rod 52 through which a package is picked with suction. The vacuum sensor 58a will sense when a package is properly positioned on the suction head 56, for example, by detecting air flow therethrough. The suction head 56 and carried package are then moved to the storing means, such as the storing rod 48, to deposit the package thereon. Preferably, the storing means is a storing rod 48 which extends from the housing 49 such that the suction head 56 and the extension rod 52 can deposit a package 14 thereon. The obtaining means 49 is also composed of a cylinder 48A which allows an assembly of both

holding rod 48 and pusher plate 57 to move in the Y direction. The holding rod 48 is also attached to a cylinder 48B which allows the storage rod to retract and extend in reference to the obtaining means. The pusher plate 57B is also attached to a
5 cylinder 57A which allows the plate to move in the positive Z direction. This action is necessary to push drugs off of the storage bar 48 during the dump process.

The extension rod 52 can move in the Y and Z directions to place a picked package on the storing rod 48 under the action
10 of up/down cylinder 51 and in/out cylinder 53. Valve 57 activates cylinder 51 to move both the cylinder 53 and the extension rod 52 in the Y direction. Valve 59 activates cylinder 53 to move the extension rod in the Z direction. Valve 54 provides air to the vacuum generator 58 to suction in head 56
15 sufficient to pick a package from a rod 30 of the support structure 28 and then hold it to the suction head 56. The suction head 56 preferably has two faces 60 and 61 through which suction can be drawn. One face 60 is capable of picking a package from a rod 30 of the storage rack and the other face 61
20 is capable of picking a package from a storing rod 48 of the picking means 38. As shown in Figure 2, each package preferably has a face 62. The packages are held by the storing rod 48 and the rods 30 of the support structure 38 such that the face 62 of each package is parallel to the Y axis. The outside face 60 is
25 utilized when a package 14 is being removed from a rod 30 in the supply rack, and the inside face 61 is utilized when a package is being removed from the storing rod 48 of the picking means 38.

In an alternative embodiment, the rods 30 extend from the double rod support bar 64 in sets of two as shown in Figure 14. A first rod 65 and a second rod 66 of each set point essentially in the Z direction, but approximately 180 degrees apart from each other. This embodiment shown in Figure 15 includes a first tooling support structure 70, a second tooling support structure 72, a first end of arm tooling 67 and a second end of arm tooling 68 that picks the packages 14. Each tooling support structure has at least one column type vehicle 44 and at least one track 42 to support the column 44. Column 44 moves along the respective tracks 42 to pick a given package 14 from a corresponding support rod 30, or restock a support rod 30 with an associated package 14.

In the operation of the preferred embodiment in a hospital, doctors visit patients in nursing units and write out medication orders for each patient. A patient is typically placed on a certain medication treatment which requires multiple doses of medication over a period of a day. Some medications are administrated at certain times of the day and possibly at intervals of several hours. Patients may also request certain medications on an elective basis for disorders such as headaches. These requests are included in the doctor's order that is sent from the nursing unit to the central pharmacy of the hospital. Once an order is received by the pharmacy, it is checked by registered pharmacists and input into the pharmacy information system. These orders reflect not only orders that are added to a

particular patient's treatment, but changes in the medication treatment. The pharmacy information system combines this information with the patient's existing medication schedule and develops a patient medication profile. A fill list is generated
5 from that profile. The fill list is a list of all the medications that must be distributed to all patients for the day. This information is sent to the pharmacy printer where a hard copy is generated.

Means for communication between the pharmacy information
10 system and the present system exist by either tapping the serial data print stream of the pharmacy information system or by a direct bi-directional communication link. The relevant information concerning the patient including drug type, dosage and frequency is placed in the database of the system. The
15 database contains information about which drugs are to be dispensed that day to the patient and all drugs that have been dispensed in the past to the patient. Information from the pharmacy information system is received on an ongoing basis throughout the day. New information can be entered into the
20 database at any time. In addition to the fill list, new orders and patient admittance, discharge and transfer information are received and stored.

Figure 16 is a flowchart with respect to the processing of a patient prescription. A similar method would be followed
25 for retrieving other stored products. The software for processing an order is started as indicated by box 180. Then the

steps indicated by boxes 181 thru 202 are followed. Before a box is loaded onto the conveyers, the operator scans the location barcode and the patient barcode on the patient box. The system then checks its database to ensure that that patient is still at that location. If a new patient has been transferred or admitted to that location, the system automatically generates a barcode label with that patient's identification number on it. This label is then manually applied to the patient box and the box is placed on the conveyor. If no patient is registered in the room, the box is placed aside and the operator proceeds with the next patient box to be filled. When the turn comes for the patient box 36 to be filled, it is shuttled into a position on the conveyor 34 such that the gripper assembly 38 can communicate with the box 36 as shown in Figure 1. A stationary bar code reader 90 reads the bar code on the patient box 36. The patient identification number is then parsed from the bar code input. This causes the fill list for that particular patient to be retrieved from the database as indicated in box 185. The fill list is converted to data consisting of locations and number of picks. At box 187 the data is then downloaded to a robot controller or gantry control program in order for the computer 24 to control the end of arm tooling 38 such that it knows what packages 14 to obtain and place in the patient box 36.

The system is now ready to pick the drugs 188. First, the column-type vehicle 44 goes to the rack where the drug to be selected is stored and stops at the X coordinate of that drug

package. The picking means 38 then moves along the column 44 to the Y coordinate of the medicine package to be picked. It is also turned to the proper storage rack 12 which has the desired package 14. These actions may also be performed simultaneously by the system 189.

When the end of gripper assembly 38 is properly positioned, the bar code reader 26 reads 190 the identity 16 on the medicine package 14 in order to confirm that it is the proper medicine package to be picked with respect to the patient's prescription. After such confirmation the suction rod 52 extends in the Z direction by pneumatic cylinder 53 such that the outside suction face 60 contacts the package face 62. Valve 54 activates a suction through the air lines 55 such that a suction drawn through the suction face 60 grabs the medicine package 14 sensor 58a detects when the contact is proper between the suction face 60 and the medicine package 14, as indicated at box 192 of Figure 16. Then the extension rod 52 retracts from the rod 30 of the support structure 28, pulling the medicine package 14 with it. Once the medicine package 14 is clear of the rod 30, the extension rod 52 positions the medicine package 14 that it has obtained, upon the storing rod 48 as indicated by box 193.

The system now prepares for the next pick. This operation is indicated by box 194 includes several actions. Once the package 14 is on the storage rod 48, the vacuum valve 54 terminates the suction and the medicine package is released from the suction face 60. The vacuum valve 57 then activates the

cylinder 51 such that the extension rod 52 (and cylinder 53) are moved in the Y direction so the bottom of the suction head 56 is above the package 14 on the storing rod 48. The extension rod is then moved forward in the Z direction and downward in the Y
5 direction by the respective valves and cylinders to clear the package and position the suction head 56 for the next pick. In an alternative embodiment the storage rod 48 is moved down rather than moving suction head up 56 to provide clearance between them when the suction head moves in a Z direction. The computer 24
10 then notes that the medicine package 14 with the appropriate medicine has been picked.

The final series of operations indicated by boxes 195 thru 202 involves a comparison of the drug identified by the reader as having been picked with the list of drugs to be
15 selected. If an incorrect drug was selected the gripper assembly moves to a reject area, places the incorrect drug there, removes that drug from the list of items selected and is ready to pick more drugs. If the correct drug was selected the system records that fact and is ready to pick more drugs. The process is
20 repeated for all the medicine identified in the patient's prescription until all of the medicine packages 14 needed have been picked.

The gripper assembly containing all desired packages then positions itself so that it is over the patient box 36. The
25 gripper assembly 38 then positions the outside suction face 60 behind the medicine packages on the storing rod 48 that have been

collected. Packages can be dropped into the patient box by retracting rod 48 by actuating cylinder 48A to the position shown in Figure 10. The storage rod 48 is then moved into the negative Z direction so that the suction face no longer holds the packages in place. The cylinder 48B then causes the storage rod 48 to be retracted which will cause the drugs to be dumped into the box.

Alternatively, the suction head may be stroked forward in the Z direction so that all packages 14 are pushed off the storing rod 48 into the patient box 36. Movement of the suction head is accomplished by the vacuum system. Vacuum valve 57 activates the cylinder 51 to retract in the positive Y direction such that the bottom of the suction head 56 is above the tops of the packages 14 on the storing rod 28. Then vacuum valve 59 activates cylinder 53 to retract the extension rod 52 in the negative Z direction such that the outer suction face 60 is behind all of the medicine packages 14 on the storing rod 48. Vacuum valve 57 is then activated such that the suction head 56 is dropped back down in the negative Y direction to be behind the packages 14. Finally, vacuum valve 59 is activated such that the extension rod 52 is extended in the positive Z direction and the front suction face 60 pushes all packages 14 off the storing rod 48 into the patient box 36.

In the event that the wrong medicine package 14 was scanned and is picked, or the medicine has expired, then picking means 38 will have placed those packages in a reject or return area, where the medicine package 14 can be disposed. A pharmacy

technician will then manually sort the drugs in the reject area, removing expired drugs and placing the others in the supply rack in order that they might be returned to their correct location in the system. The process is then repeated for the next drug on
5 the prescription list that has not yet been obtained.

The flow chart of Figure 17 is the process of checking the selected packages which have been placed in a patient box. Such checking is performed at the check station. The process begins by calling up the check program indicated by box 105. The
10 bar code on the patient box is scanned 106 and the patient number portion of the bar code is identified 107. The patient number is displayed 108 on the screen at the check station. Then the packages in the patient box are scanned 109. The identification of the packages is compared with the list of drugs that had been
15 ordered for the patient in a verify step 110. If correct packages are in the box, the checking of the box is complete and the system is ready for the next box 111. If the packages in the box do not match the order the system determines if the problem can be corrected 112. If so, the correction is made 113 and the
20 verify step is repeated. If not, the box is dumped 114 and the order is recorded as not filled or the box is resubmitted and the missing medications are filled by the system. For example, should the system determine that an item is missing it may either create a modified list and send the box on with a modified list
25 or it may instruct the picking means to get the missing item.

The return process is shown in the flow chart of Figure 18. The process starts 115 by calling up the return program. The patient box containing the returned items must be positioned so that the patient box can be scanned 116 for the patient identification number 117 and the nursing unit from which the box was returned. If the box has come from the proper nursing unit the system retrieves the patient dispensing record 120 and displays that record 121 for the operator. Next the packages are scanned 122. The system preferably verifies 123 that the scanned packages had been sent to the patient making the return. Next the system checks each package 124 to determine if the drug is useful or if it has expired, been recalled or otherwise should not be returned to the supply rack. If no, the package is discarded 125. If yes, the package is returned to the supply rack 126. If more drugs remain in the box the process is repeated 127. If no packages remain, the system may further process the list of returned packages 128 to modify the patient's record, update the system inventory log or display the list of returns for review by the operator.

The process of restocking returned or new packages to the storage rack is diagramed in Figure 19. These packages are manually placed on a return or supply rack and the program for restocking is called up 130. The program causes the picking means to be positioned 131 so that the gripping assembly can pick packages from the return or supply rack. The bar code on the first package is scanned 132 and the portion of the scanned bar

code which identifies the drug is found 133. The system then checks the database 134 for the location in the storage rack which has been designated for the identified product. The system extends the vacuum head 135 to engage the package. Suction is applied 136 and a suction sensor is checked. This should cause the package to be held by the gripper assembly which fact will be confirmed by the sensor 137. The gripper assembly positions the package 138 on the storage rod 48 in the gripper assembly. Then the suction is released and the gripper assembly is ready to place additional packages on the storage rod. If more packages remain on the return or supply rack 140, the process is repeated until all packages are on the storage rod or the storage rod is full. The gripper assembly is then moved to a position 141 in front of the storage rack to properly place the outermost package on the storage rod. That package is grasped 142 using back suction cups 61 (see Figure 11). The extension rod 52 is retracted in the negative Z direction such that the inside suction face 61 is in contact with the medicine package 14. The sensing means 58 determines whether proper contact is made. Then the extension rod 52 is moved a predetermined distance in the positive Z direction 143 to place the medicine package over a rod 30 of support structure 28. Vacuum valve 54 is then deactivated 144 to stop suction, allowing the medicine package 14 on the suction face 61 to drop away therefrom. The extension rod 52 then moves in the negative Z direction towards the medicine packages 14 on the storing rod 48 to repeat the process. While

it moves back to obtain another medicine package 14, the sensor 58 trips when contact is made. The process can be repeated 141 until there are no more medicine packages 14 on the storing rod 48. The computer 24 knows when to stop returning packages since
5 it knew how many packages had been placed on the storing rod 48.

In the event that all drugs to be returned or restocked at a particular storage location are identical the process is some what different. Packages are picked from the supply rack in the method detailed above. The gripper assembly is then moved to
10 a position in front of the storage rack to place the remaining packages on the storage rod. Cylinder 48A causes the assembly of storing rod 48 and pusher plate 57B to move in the negative Z direction. Storage rod 48 is co-linear with a rod 30 of support structure 28. Pusher plate 57B then moves in the positive Z
15 direction pushing all remaining packages on storage rod 48 on to rod 30.

The restocking of the storage racks 12 can be carried out during the evening when packages are not being gathered to fill orders. Alternatively, restocking can be carried out
20 simultaneously with picking if the system 10 has a pair of rods as shown in Figure 14, a first end of arm tooling 67, second end of arm tooling 68 and a first tooling structure 70 and a second tooling structure 72 is utilized, as shown in Figure 15. While, for instance, the first end of arm tooling 67 is picking medicine
25 packages 14 to fill a patient's prescription, the second end of arm tooling 68 can be restocking the second side of the

storage area 12.

Although the invention has been described in detail in the foregoing embodiments for the purpose of illustration, it is to be understood that such detail is solely for that purpose and
5 that variations can be made therein by those skilled in the art without departing from the spirit and scope of the invention except as it may be described by the following claims.

We claim:

Sub
Claim 1
1. A system for selecting and delivering packages from a stored area to fill orders comprising:

- a) a storage area comprised of a plurality of locations each location being sized and configured to hold at least one package in a manner so that the package can be placed into and removed from the locations by automated picking means, each location having a distinct x, y coordinate;
- b) automated picking means sized and configured to be able to hold packages, to select packages from storage area locations and place packages in storage area locations in accordance with instructions received from a computer, the picking means having a gripper for grasping and moving individual packages;
- c) a computer having at least one memory which contains a program for directing the picking means to chosen storage area locations and a database containing at least one x, y coordinate location in the storage area for each package held within the storage area,

wherein only one type of package is stored in each x, y coordinate location.

2. The system of claim 1 wherein the gripper is a vacuum head.

3. The system of claim 1 also comprising a sensor
a attached to the picking means for determining when ^{the} ~~a~~ package is
grasped by the gripper.

~~4. The system of claim 1 wherein at least one package
has a machine readable label identifying contents of the package
and also comprising a package reader attached to the picking
means for reading the label.~~

4
5. The system of claim ~~1~~ wherein the label is a bar
code and the reader is a bar code reader.

5
6. The system of claim ~~1~~ wherein the label also
contains an expiration date.

10
a2 } 7. The system of claim ~~1~~ wherein the picking means
contains a picking means storage area for holding packages
selected by the picking means.

7
8. The system of claim ~~1~~ wherein the picking means
storage area is comprised of at least one storage rod and holes
are provided in the packages to permit the packages to be held on
the storage rod.

¹⁰³⁷9. The system of claim 1 also comprising a supply station for receiving new and returned packages, the supply station having a plurality of locations each location being sized and configured to hold at least one package in a manner so that the package can be placed into and removed from the locations by automated picking means, each location having a distinct x, y coordinate.

10. The system of claim 9 wherein the supply station is movable and is sized to be removably positioned adjacent the storage area.

11. The system of claim 1 wherein the storage area is comprised of a plurality of rods and a hole is provided in each package to permit the package to be held on the rods.

¹¹
12. The system of claim 1 also comprising at least one data transmission port attached to the computer through which a list of packages to be selected can be input and a list of packages selected by the system can be output.

¹²
13. The system of claim 1 wherein the memory contains a program for checking compatibility of products in packages selected by the picking means with other products listed in the database.

¹³
~~12~~. The system of claim 1 also comprising a conveyor positioned to receive packages from the picking means.

¹⁴
~~13~~. The system of claim ¹³~~12~~ also comprising a plurality of containers positioned on the conveyor, the containers being sized and positioned to receive packages from the picking means.

¹⁵
~~14~~. The system of claim ¹⁴~~13~~ wherein the containers have machine readable labels.

¹⁶
~~15~~. The system of claim ¹⁵~~14~~ wherein the labels are bar codes.

~~18. The system of claim 15 wherein each package and each container have machine readable labels.~~

¹⁷
~~16~~. The system of claim ¹⁶~~15~~ wherein the labels are bar codes.

¹⁸
~~17~~. The system of claim ¹⁷~~16~~ also comprising a check station located adjacent the conveyor, the check station having reading means for reading the machine readable labels.

¹⁹
~~18~~. The system of claim ¹⁸~~17~~ wherein the reading means is connected to the computer in a manner to input information from the machine readable labels; the computer having a program for

a storing the input information in ^{the} memory and for comparing the input information to other information contained in the database.

~~21~~²¹. The system of claim 1 wherein the packages contain individual doses of medicine.

~~22~~²². The system of claim 1 also comprising a track over which the picking means travels according to directions supplied by the computer also comprising means for moving the picking means over the track.

~~23~~²³. A system for selecting and delivering packages from a holding to fill orders comprising:

- a) holding means comprised of a frame having a plurality of support rods for holding medicine packages, each rod associated with a given medicine and holding medicine packages with only the same medicine;
- b) means for supplying medicine packages to the support rods;
- c) means for picking medicine packages from the support rods in accordance with instructions received from a computer, said picking means being able to access the holding means and the supply means;

d) a computer having a database containing the locations of all packages in the holding means able to receive orders for packages and able to direct the means for picking packages.

25. A system as described in claim 24 wherein the structure includes a plurality of rod supports from which the rods extend, said structure with back rod supports form an X, Y coordinate system with each rod and medicine packages therein having a unique X and Y coordinate, said picking means disposed adjacent said structure such that a given medicine package on an associated rod can be picked by the picking means to fill a patient's prescription; or a given medicine package in the supplying means can be picked by the picking means to restock the associated rod.

26. A system as described in claim 25 including a conveyor in communication with the picking means; and patient prescription boxes which are moved by the conveyor to the picking means such that the picking means provides the medicine packages it has picked to fill a given prescription to an associated box.

27. A system as described in claim 26 wherein the picking means includes at least one gripper that picks the medicine packages; and a tooling support structure having at least one column to support the tooling and at least one row to

~~support the column such that the tooling moves along the column~~
as the column moves along the row to pick a given medicine
package hanging from a corresponding support rod, or restock a
given medicine package on a corresponding support rod, and means
for moving the column with respect to the row, said moving means
controlled by the computer.

28. A system as described in claim 27 wherein the
tooling is comprised of

a housing;
means for storing medicine packages attached to the
housing;
means for obtaining a medicine package, said
obtaining means slidably attached to the housing such
that it can move in a Z direction, which is perpendicular
to the X and Y directions, to pick a medicine package
from a support structure when the housing is adjacent to
and aligned with a support rod, and can move in the Z
direction to place a picked package on the storing means;
and

wherein the identifying means is part of the gripper
such that it can identify a package to be picked by the
obtaining means, each of said packages having an identity
disposed on them which can be read by the identifying
means.

~~29. A system described in claim 28 wherein the identity of each package is a bar code, and the identifying means includes a bar code reader disposed on the obtaining means.~~

30. A system as described in claim 29 wherein the obtaining means includes means for producing a suction; a suction rod in fluidic connection with the suction producing means, said suction rod slidingly attached with respect to the Y and Z directions to the housing and maintaining a suction therethrough when the suction producing means is activated;

a suction is connected to the suction rod through which a medicine package is picked with suction; and means for sensing when a package is properly positioned on the suction head such that the package rod is then moved to the storing means and deposits the package thereon.

31. A system as described in claim 30 wherein the storing means is a storing rod which extends from the housing such that the suction head and the suction rod can deposit a package thereon.

32. A system as described in claim 31 wherein the tooling includes valves and pneumatic cylinders for moving the suction rod in the Y and Z direction; and a vacuum pump for

~~providing suction to the suction rod and support head sufficient to pick a package from a rod of the support structure and then hold it to the suction head.~~

33. A system as described in claim 32 wherein the suction head has two faces through which a suction can be drawn, each face capable of picking a package.

34. A system as described in claim 33 wherein the two faces are parallel to each other and are parallel to the x-axis, and wherein each package has a face and the package are held by the storing rod and the rods of the support structure such that the face of each package is parallel to the x-axis.

35. A system as claimed in claim 24 wherein the rods extend from the back rod supports in sets of two, with a first rod and a second rod on each set pointing essentially in a Z direction, which is perpendicular to the X and Y directions, but approximately 180° apart from each other, and wherein the picking means includes a first gripper and a second gripper that picks the medicine packages; and a first and second tooling support structure, each tooling support structure having at least one column and at least one row to support the column, such that the first and the second tooling moves along the respective column and the respective column moves along the respective row of the first and second tooling support structure, respectively, to pick

~~a given medicine package from a corresponding support rod, or
restock a support rod with an associated medicine package.~~

~~Sub
a4~~ 36. A system as described in claim 20 wherein the
picking means includes at least one gripper that picks the
packages; and a tooling support structure having at least one
column to support the tooling and at least one row to support the
column such that the tooling moves along the column as the column
moves along the row to pick a given package hanging from a
corresponding support rod, said gripper able to turn on the
column to pick packages on either the first or second holding
means; and
means for moving the column with respect to the row, said
moving means controlled by a computer and in communication
therewith.



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ABSTRACT OF THE DISCLOSURE

A system for filling orders, such as prescriptions for patients, comprising a device for holding packages. Each package
5 has the same type of contents being held in a predetermined location by the holding device. Each package has an identity which defines the contents therein. The holding device has a plurality of predetermined locations corresponding to a plurality of different types of contents. Additionally, the system is
10 comprised of a device for supplying packages to the holding device. Also, there is a device for picking a package from the holding device that is identified in the order for the purpose of restocking the holding device. The picking device is in communication with the holding device and supplying device. In a
15 preferred embodiment, the contents of each package is a single dosage of medicine.

Docket No. 920015

DECLARATION AND POWER OF ATTORNEY

I, the below named inventor, hereby declare that:

My residence, post office address and citizenship is as stated below next to my respective name

I believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled

the specification of which is attached hereto.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a).

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing of this application.

<u>Application Serial No.</u>	<u>Filing Date</u>	<u>Status</u> (Patented, Pending, Abandoned)
<u>07/469,217</u>	<u>1/24/90</u>	<u>Pending</u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>

I hereby declare that all statements made hereby of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby appoint the following attorney(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith: Lynn J. Alstadt, Reg. No. 29,362; George P. Baier, Reg. No. 26,717; Paul A. Beck, Reg. No. 22,289; Michael L. Dever, Reg. No. 32,216; Gordon Harris, Reg. No. 15,384; George Raynovich, Jr., Reg. No. 19,829 and Alvin E. Ring, Reg. No. 18,697.

Address all telephone calls to Lynn J. Alstadt
 Address all correspondence to Buchanan Ingersoll Professional Corporation
56th Floor, 600 Grant Street
Pittsburgh, Pennsylvania 15219
(412) 562-1632

1-00

Full name of sole or first inventor Sean C. McDonald
 Inventor's Signature *Sean C. McDonald* Date 4/20/92
 Residence Pittsburgh, Allegheny County, Pennsylvania PA Citizenship USA
 Post Office Address 419 South Braddock Avenue, Pittsburgh, Pennsylvania 15221

Full name of second joint inventor, if any Ellen J. Hertz
 Inventor's Signature _____ Date _____
 Residence Clemmons, Forsyth County, North Carolina Citizenship USA
 Post Office Address 4232 Lake Cliff Drive, Clemmons, North Carolina 27012

2-00

Full name of third joint inventor, if any James A. Smith
 Inventor's Signature *James A. Smith* Date 4/20/92
 Residence Allison Park, Allegheny County, Pennsylvania PA Citizenship USA
 Post Office Address 3909 Ash Drive, Allison Park, Pennsylvania 15101

Full name of fourth joint inventor, if any Gregory Toto
 Inventor's Signature _____ Date _____
 Residence Santa Cruz, Santa Cruz County, California Citizenship USA
 Post Office Address 815B Corcoran Avenue, Santa Cruz, California 95062

Full name of fifth joint inventor, if any _____
 Inventor's Signature _____ Date _____
 Residence _____ Citizenship _____
 Post Office Address _____

Applicant or Patentee: Sean C. McDonald et al.
 Attorney's Serial or Patent No.: _____ Docket No.: 920015

Filed or Issued: _____



AN AUTOMATED SYSTEM FOR SELECTING AND DELIVERING PACKAGES FROM A STORAGE AREA

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS
 (37 CFR 1.9(f) and 1.27(c)) - SMALL BUSINESS CONCERN

I hereby declare that I am

☐ the owner of the small business concern identified below:
☒ an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN Automated Healthcare, Inc.

ADDRESS OF CONCERN 261 Kappa Drive
Pittsburgh, Pennsylvania 15238

I hereby declare that the above identified small business concern qualified as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under section 41(e) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention, entitled AN AUTOMATED SYSTEM FOR SELECTING AND DELIVERING PACKAGES FROM A STORAGE AREA by inventor(s) Sean C. McDonald, Ellen J. Hertz, James A. Smith and Gregory Toto described in

☒ the specification filed herewith
 application serial no. _____, filed _____
 patent no. _____, issued _____

If the rights held by the above-identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below* and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR 1.9(d) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e). *Note: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

NAME _____

ADDRESS _____

☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

NAME _____

ADDRESS _____

☐ Individual ☐ Small Business Concern ☐ Nonprofit Organization

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING Sean C. McDonald

TITLE OF PERSON OTHER THAN OWNER President

ADDRESS OF PERSON SIGNING 261 Kappa Drive

Pittsburgh, Pennsylvania 15238

SIGNATURE Sean C. McDonald

DATE 4/20/92

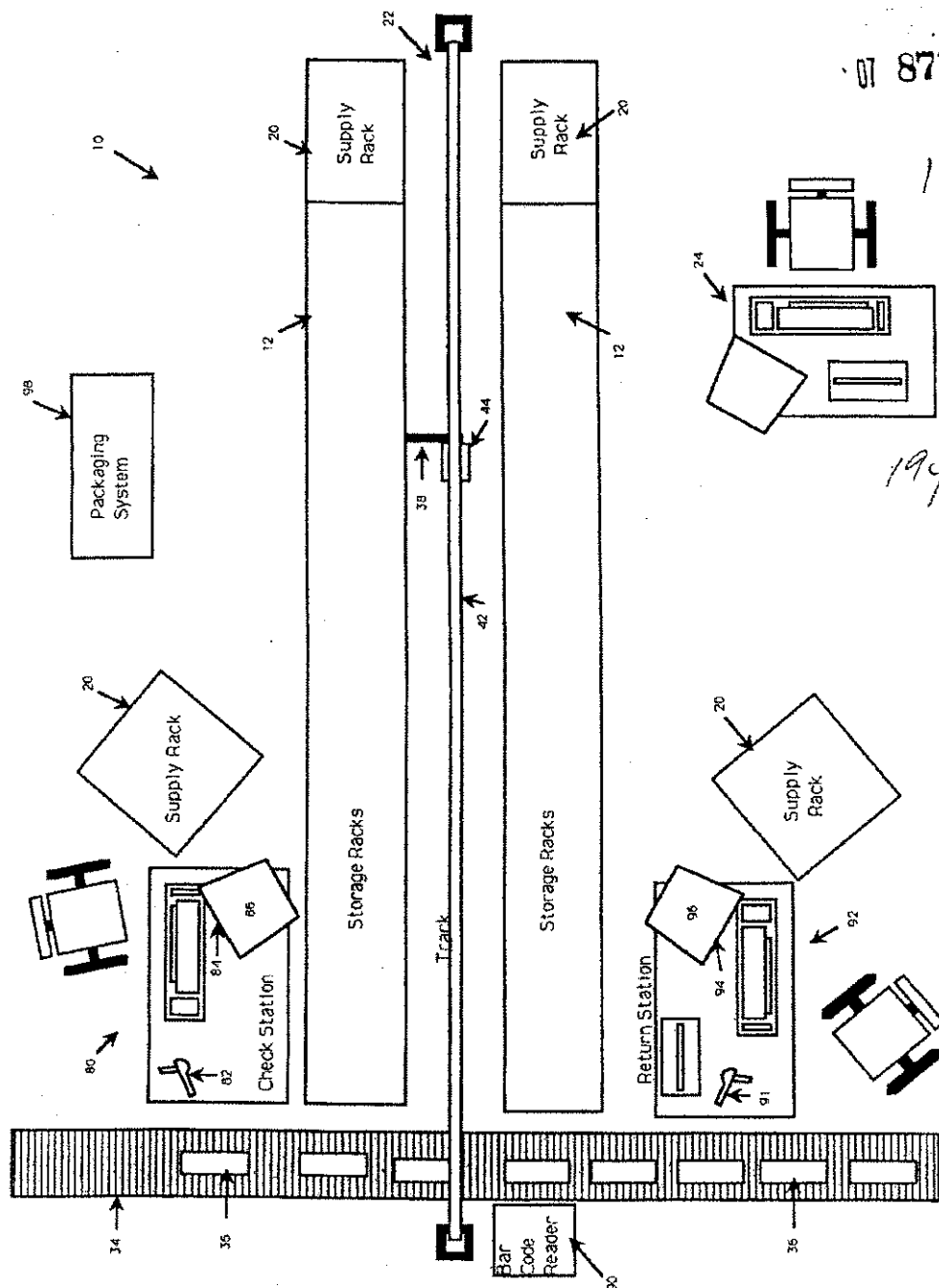


Figure 1

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194/19

APPROVED	O.G. FIG.
BY	CLASS
DATE/NAME	SUBCLAS

295495

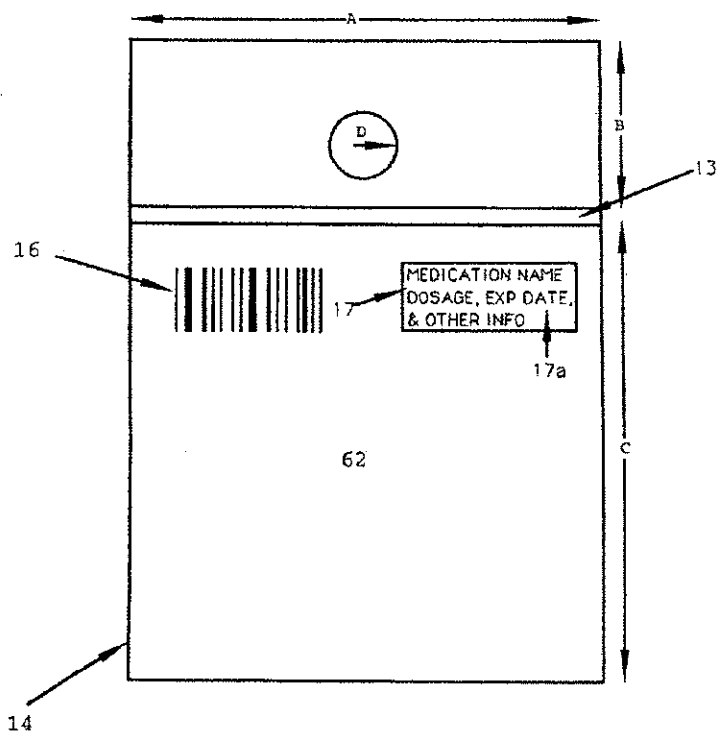


Figure 2

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
REVISION		

295495

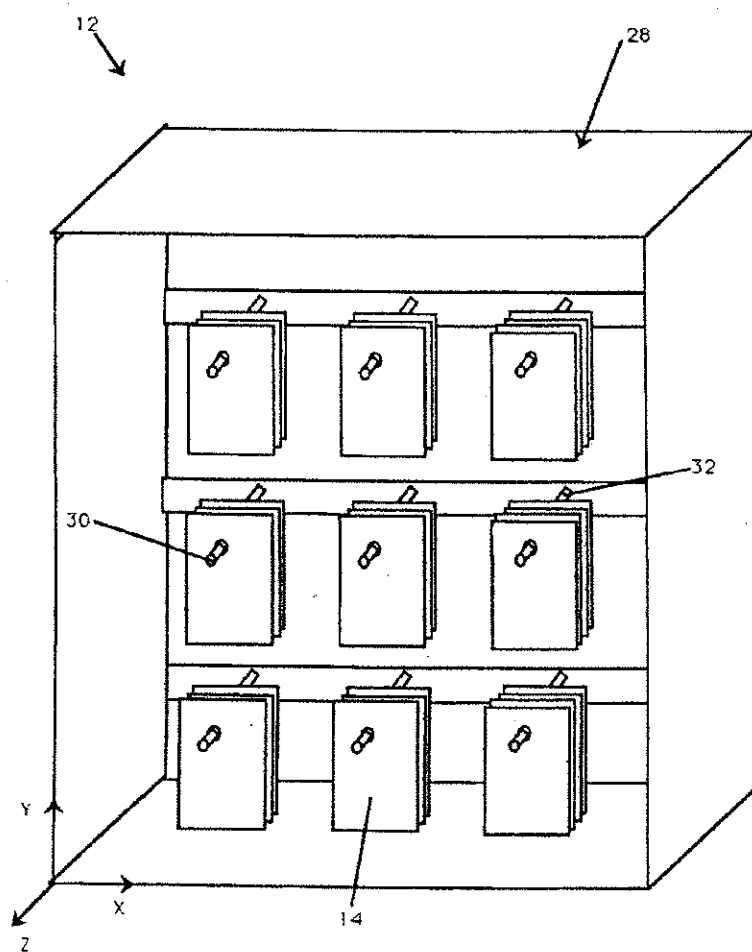


Figure 3

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DATE		

295495

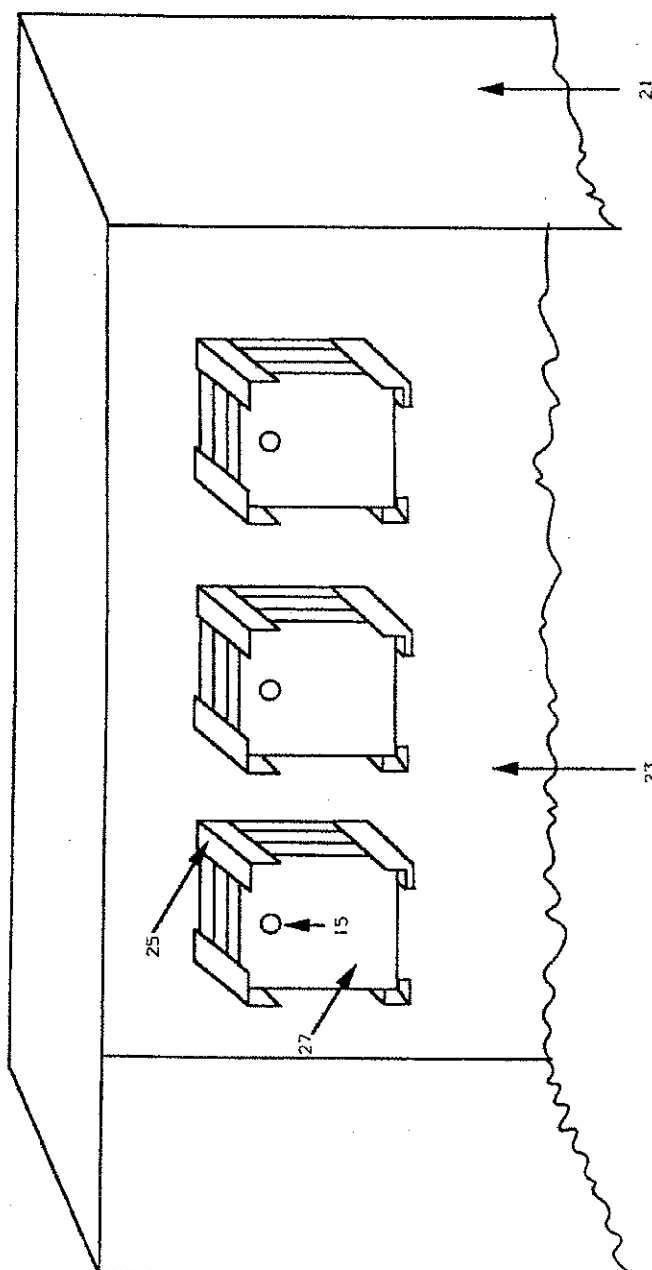


Figure 4

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DATE/CHAN		

295495

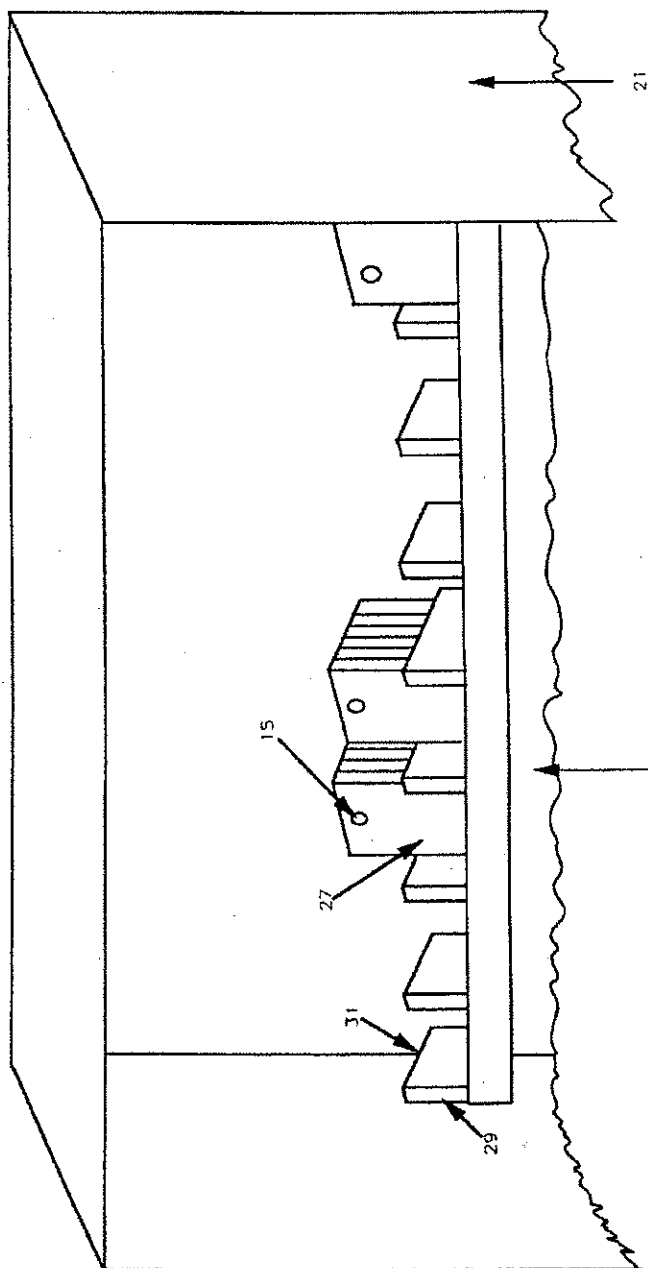
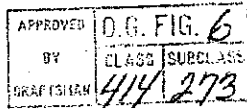


Figure 5



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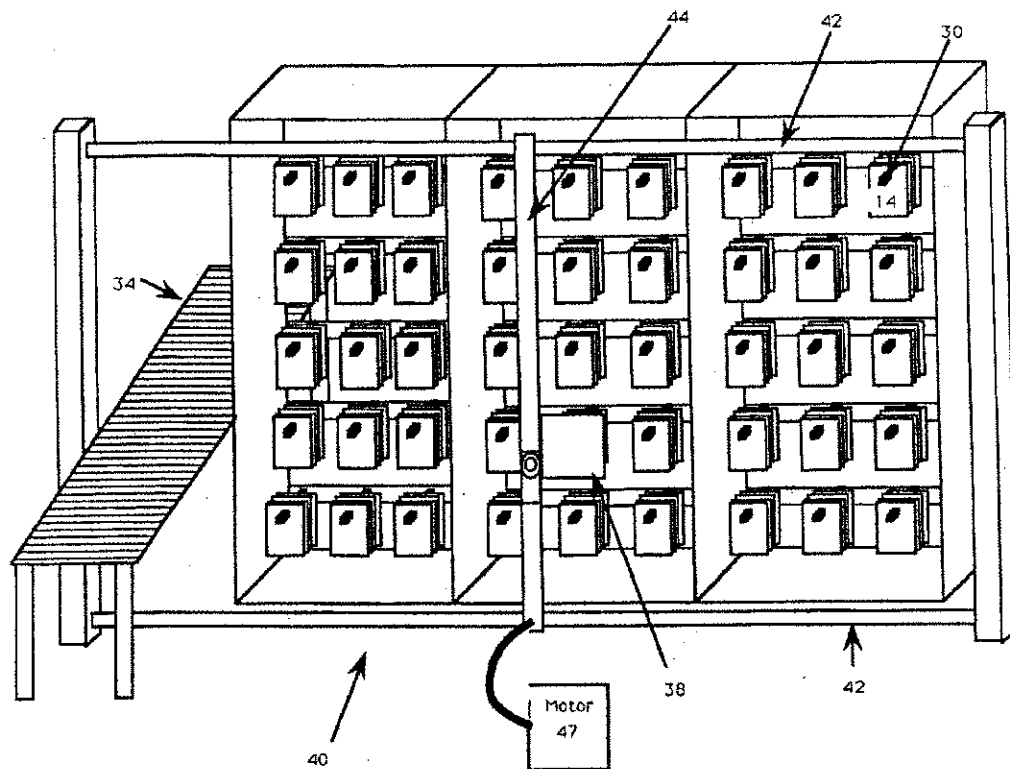


Figure 6

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTER		

295495

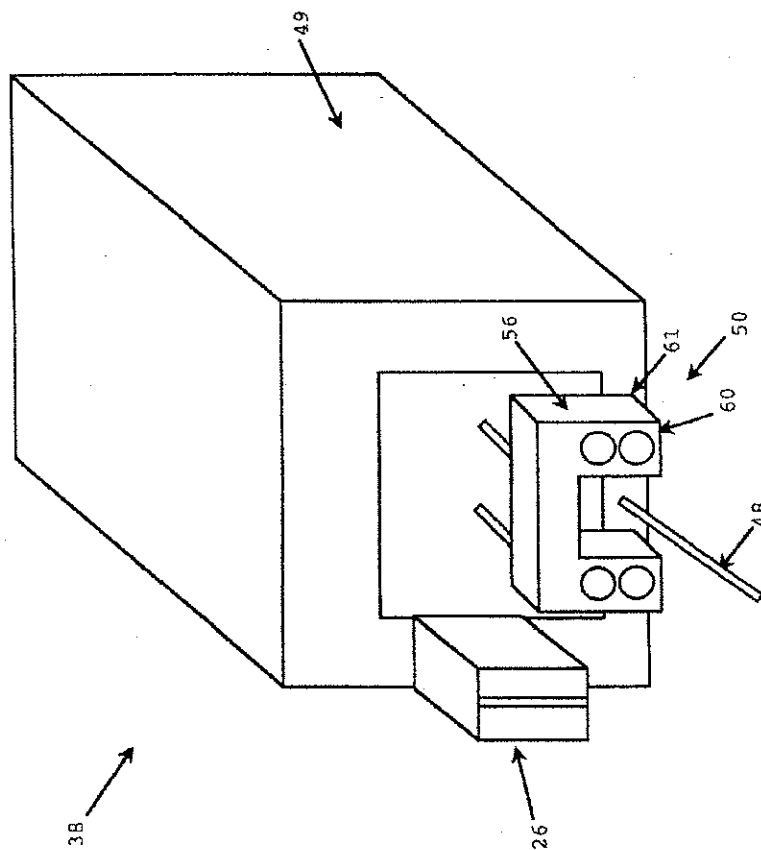
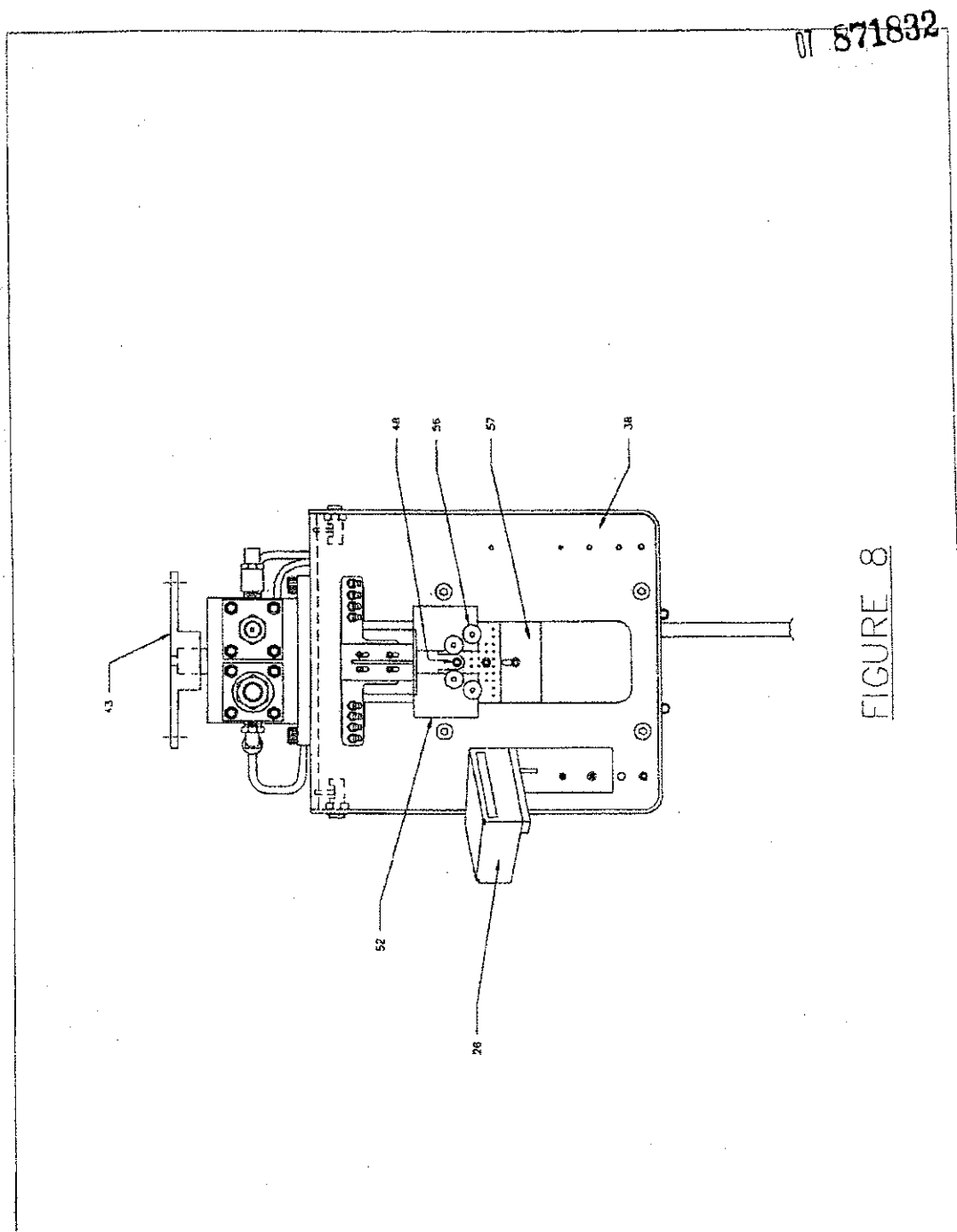
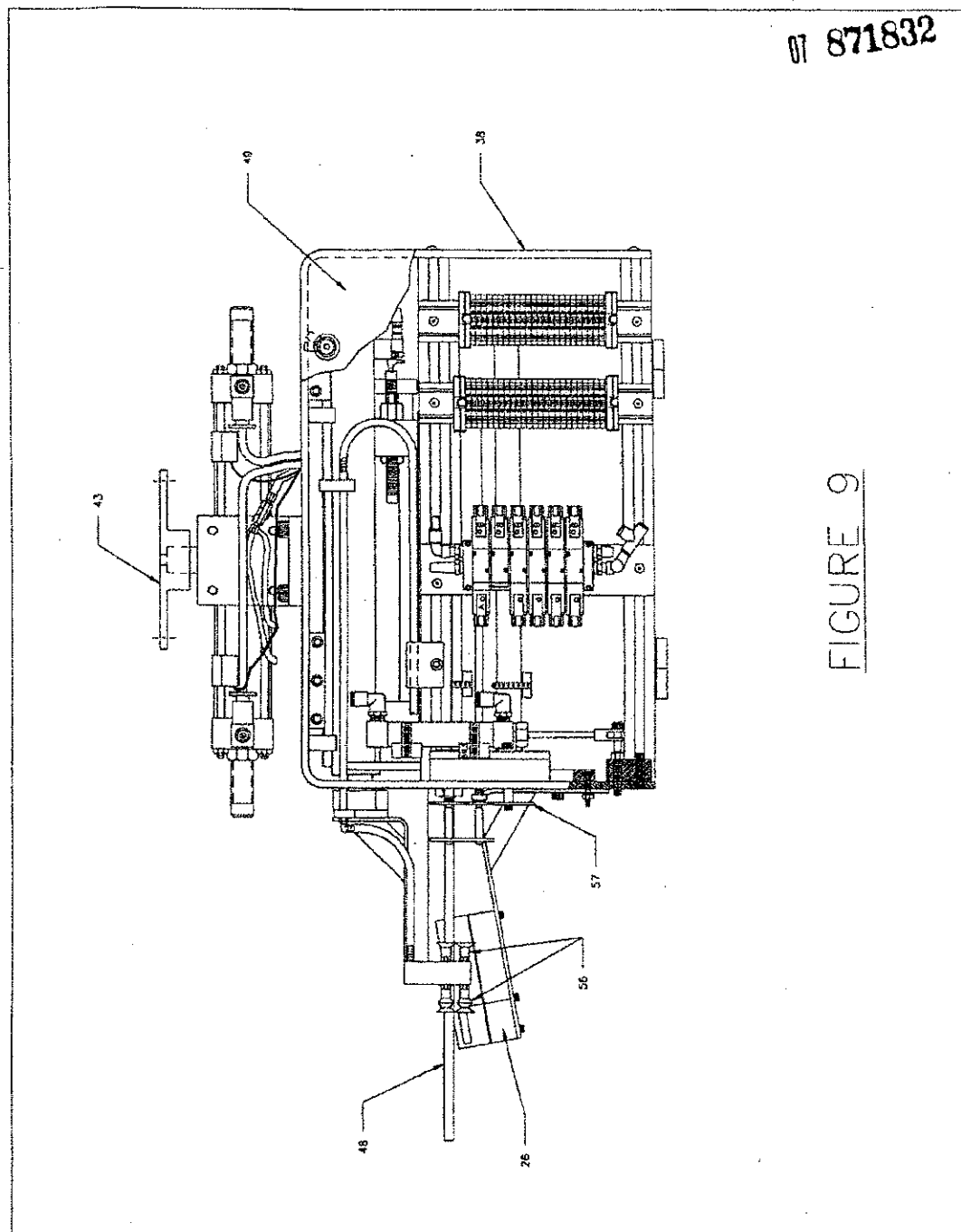
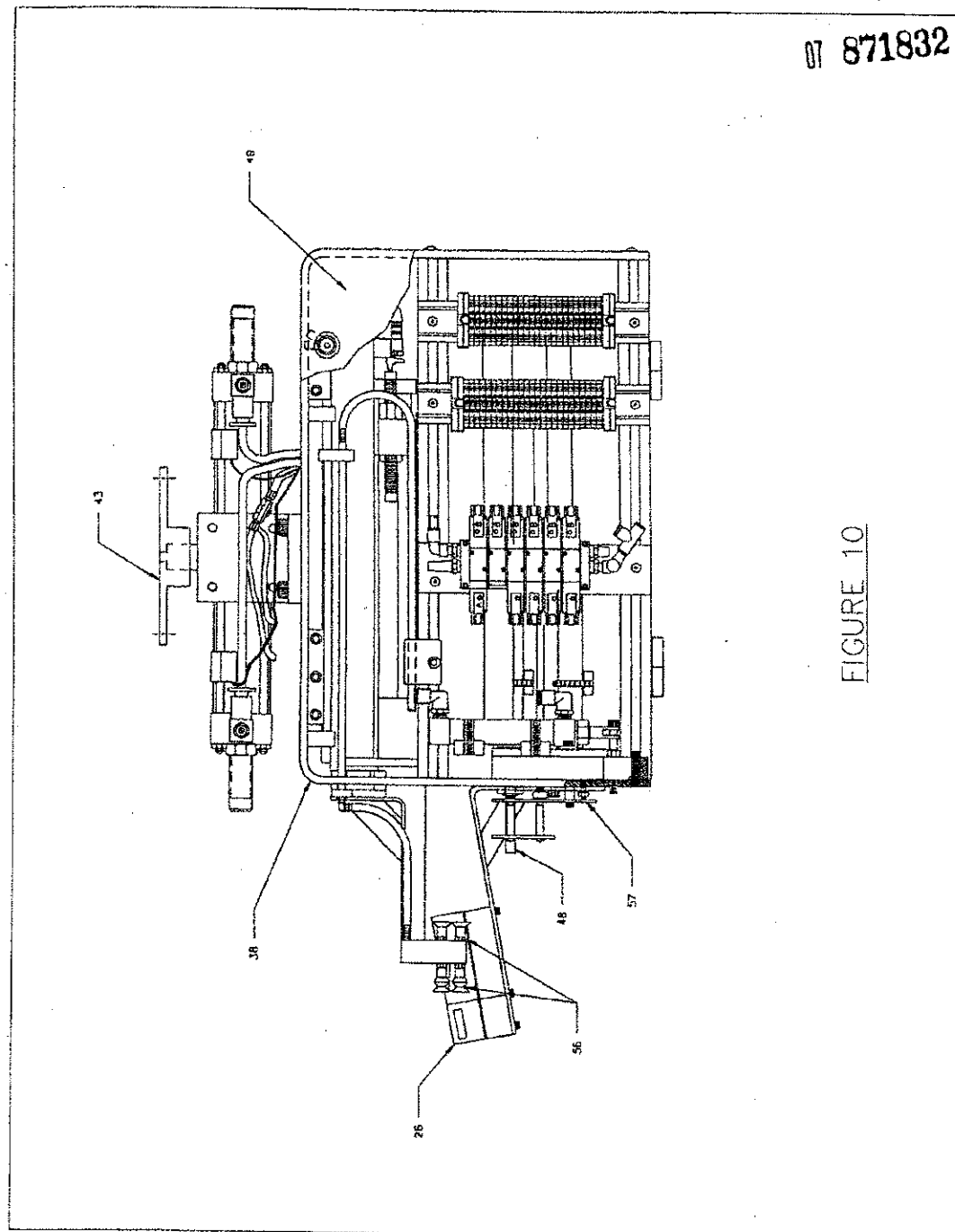
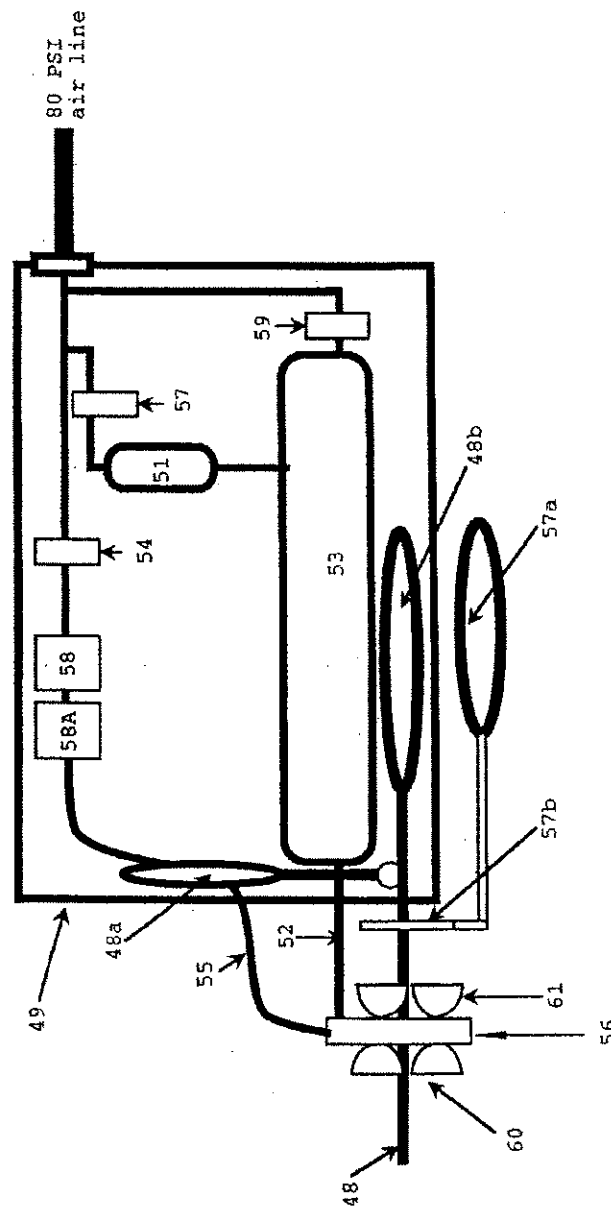


Figure 7









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Figure 11

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

295495

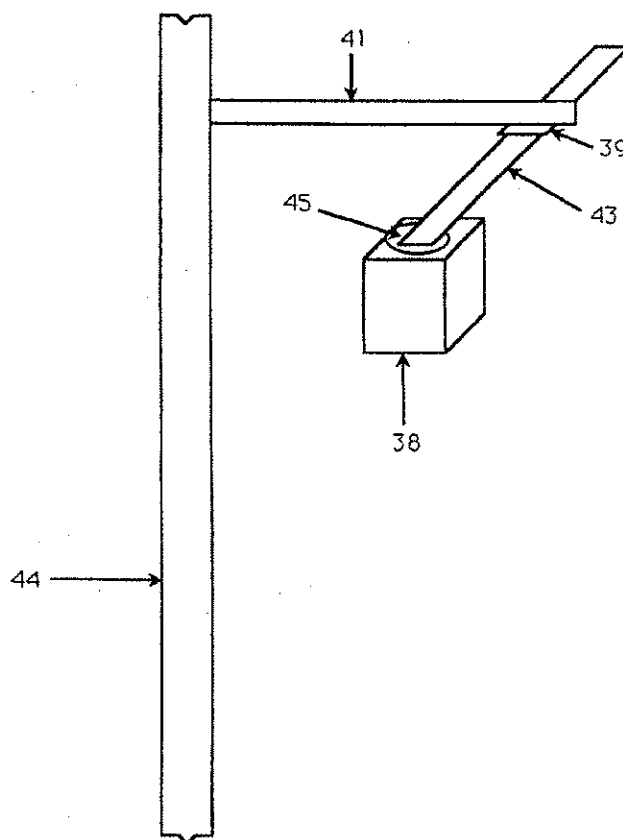


Figure 12

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
INVENTOR		

295495

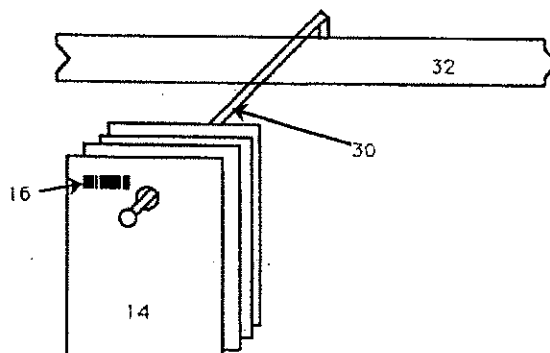


Figure 13

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

295995

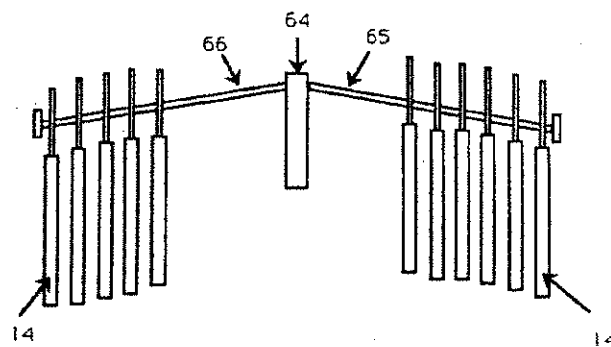


Figure 14

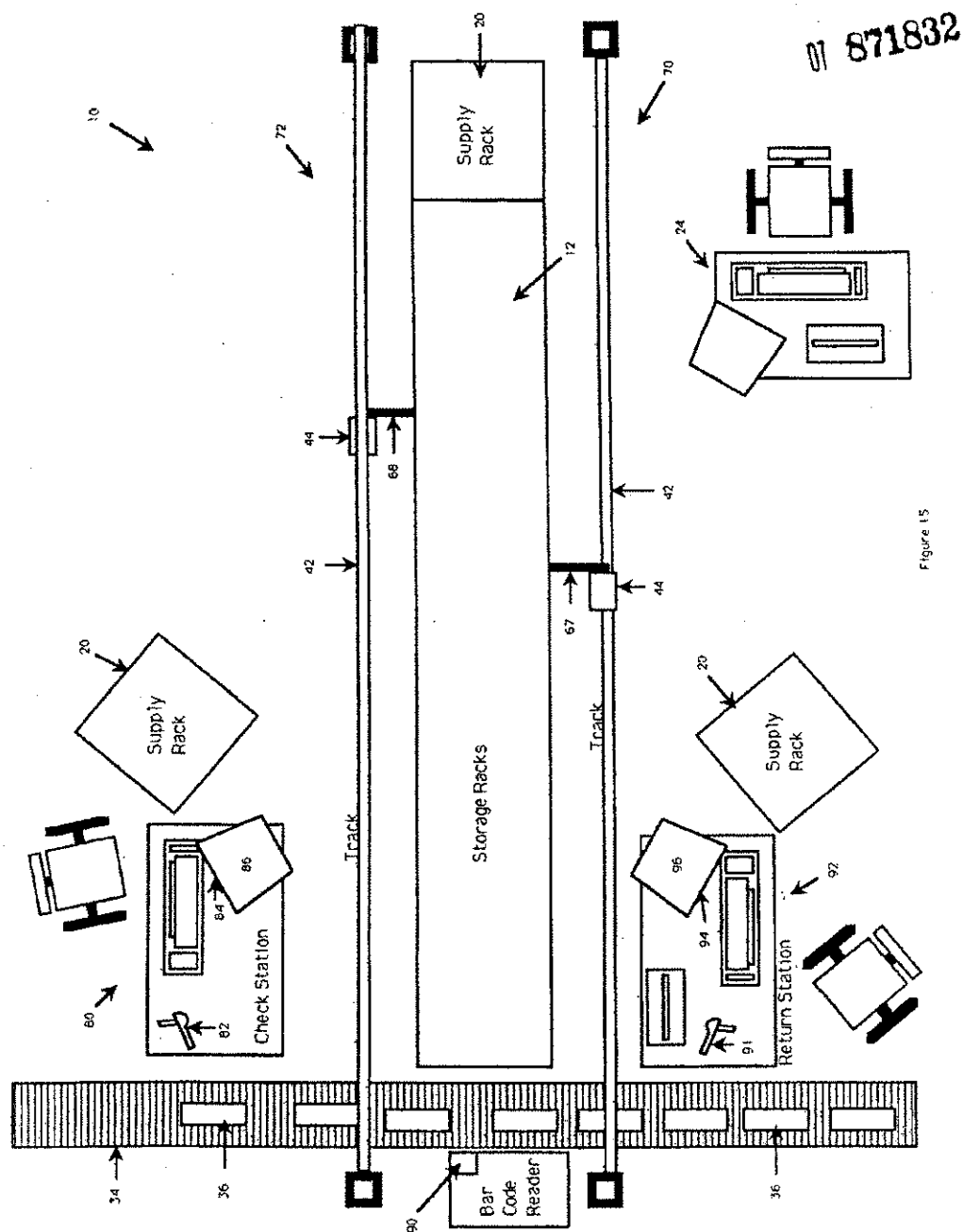
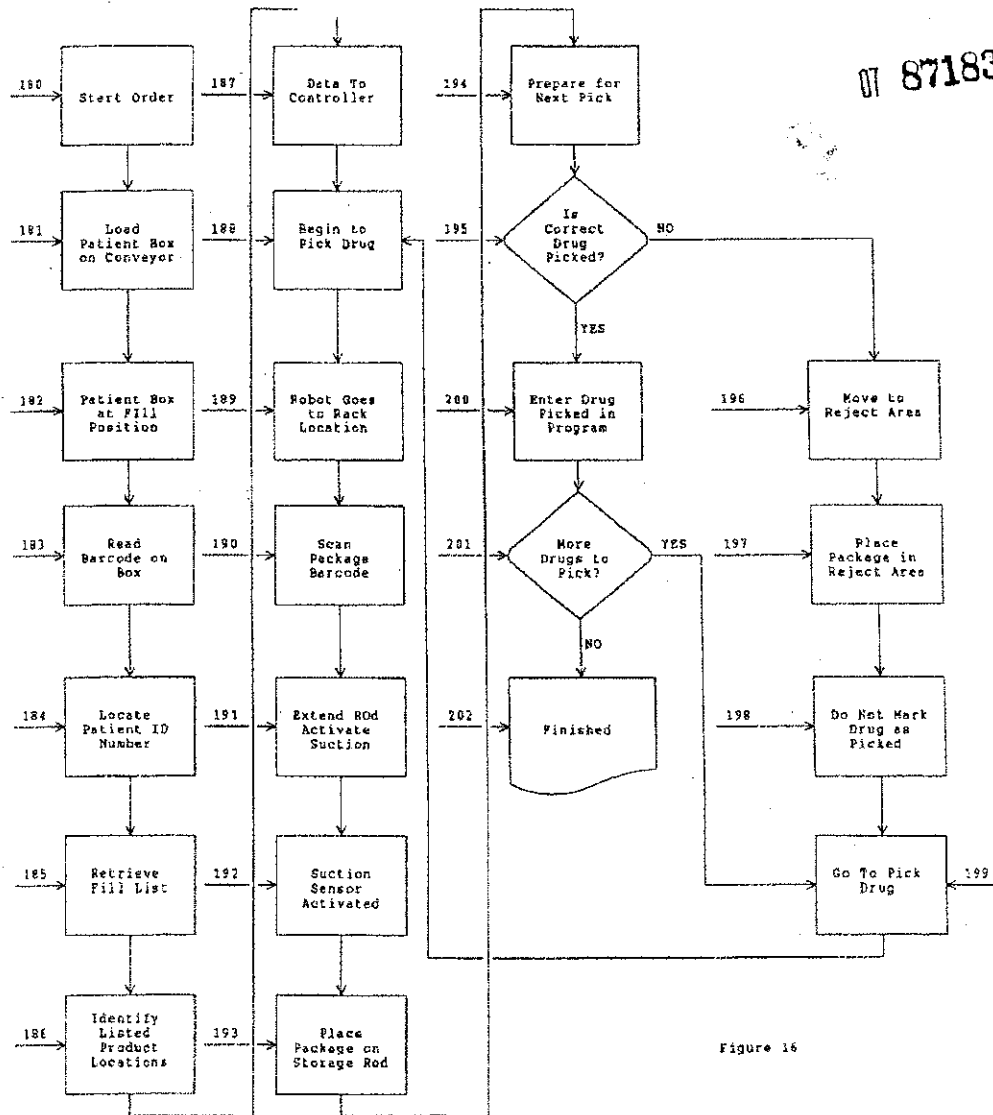
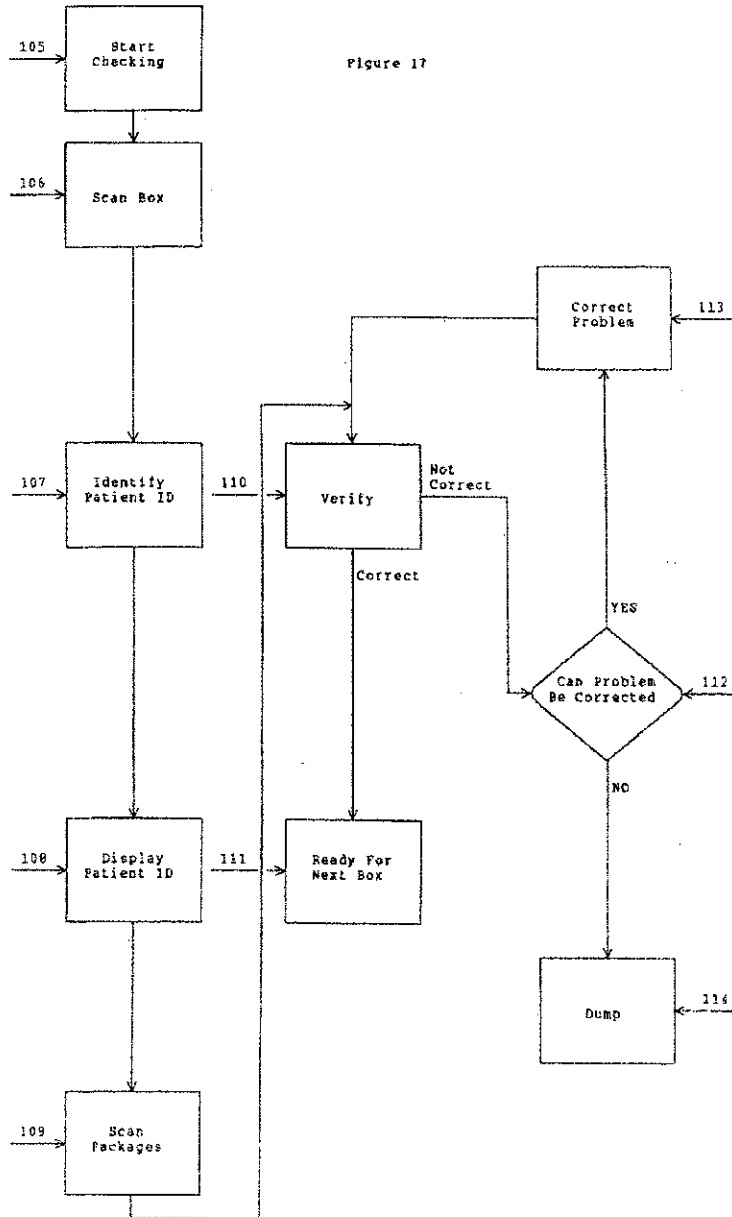


Figure 15



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Figure 17



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Figure 18

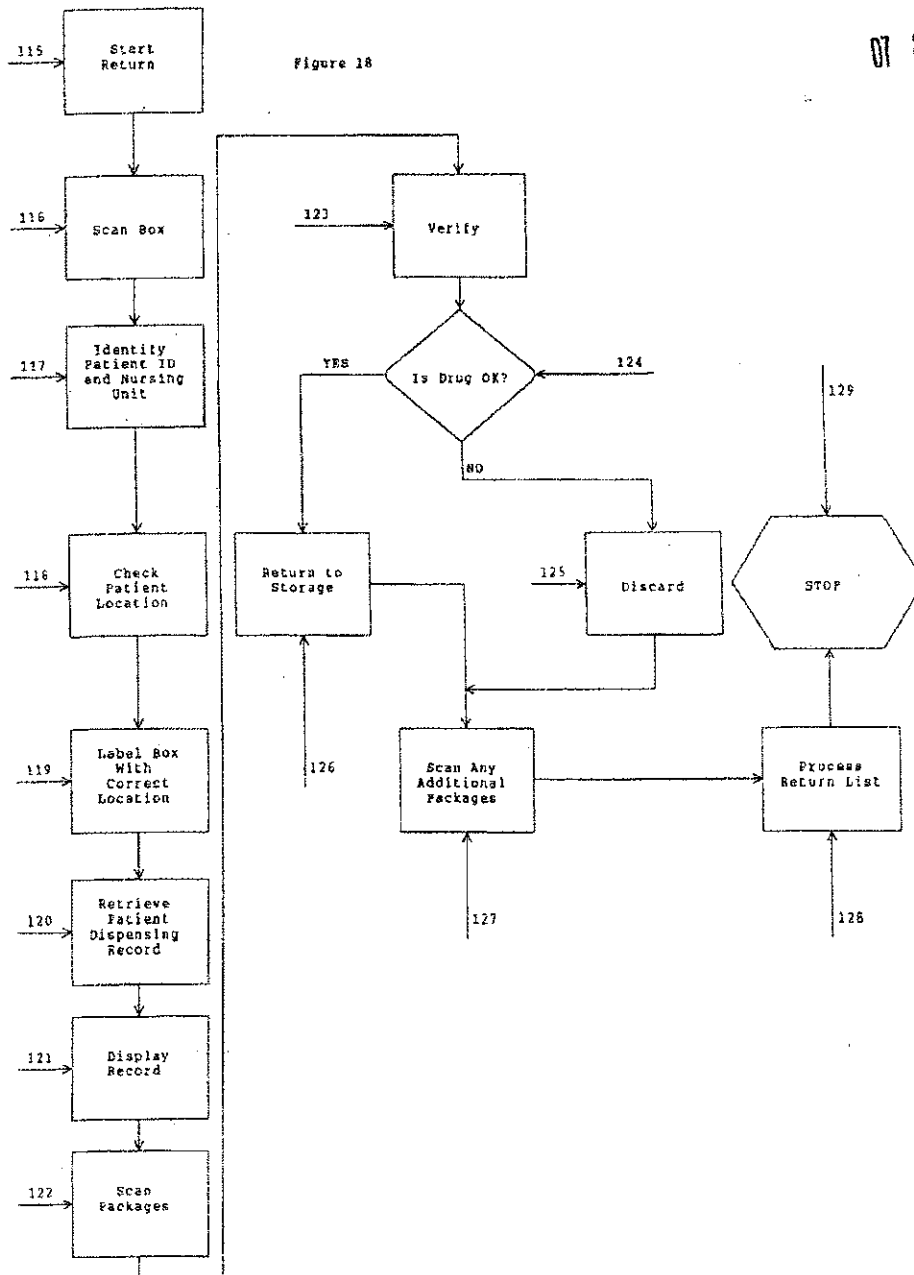
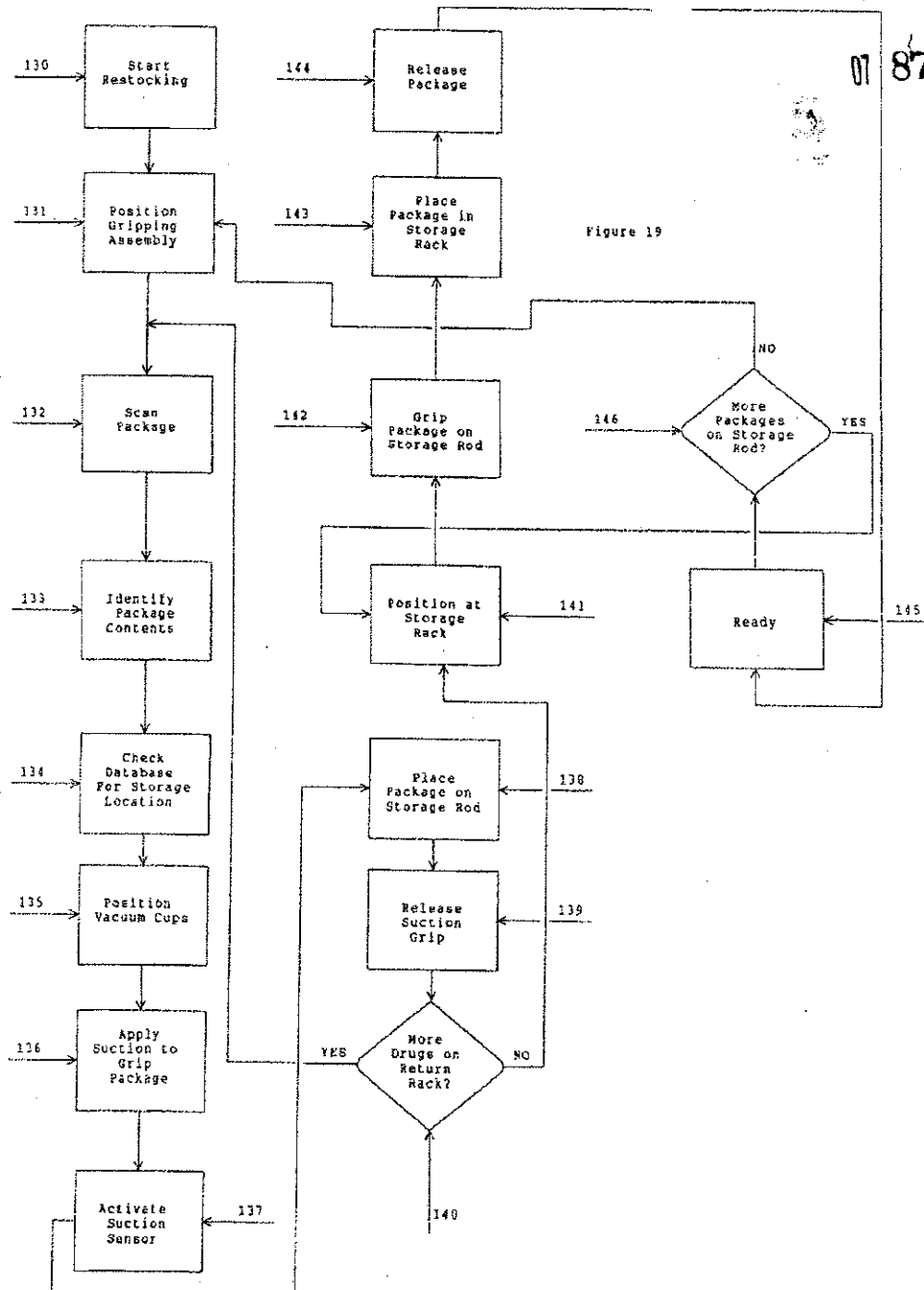


Exhibit E

Part 3





07 871832

CERTIFICATE OF MAILING BY "EXPRESS MAIL" UNDER
37 CFR 1.10 - SEPARATE PAPER -

ATTORNEY'S DOCKET NO.

920015

IN RE APPLICATION OF

Sean C. McDonald et al.

SERIAL NUMBER

FILED

FOR AN AUTOMATED SYSTEM FOR SELECTING AND
DELIVERING PACKAGES FROM A STORAGE AREA
(CIP of Serial No. 469,217, filed 1/24/90)

GRF. ART UNIT

EXAMINER

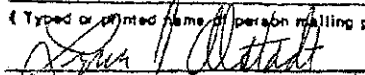
"Express Mail" mailing label number B84265991

Date of deposit April 21, 1992

I hereby certify that this paper or fee is being deposited with
the United States Postal Service "Express Mail Post Office to
Addressee" service under 37 CFR 1.10 on the date indicated above
and is addressed to the Commissioner of Patents and Trademarks,
Washington, D.C. 20231.

Lynn J. Alstadt

(Typed or printed name of person mailing paper or fee)


(Signature of person mailing paper or fee)

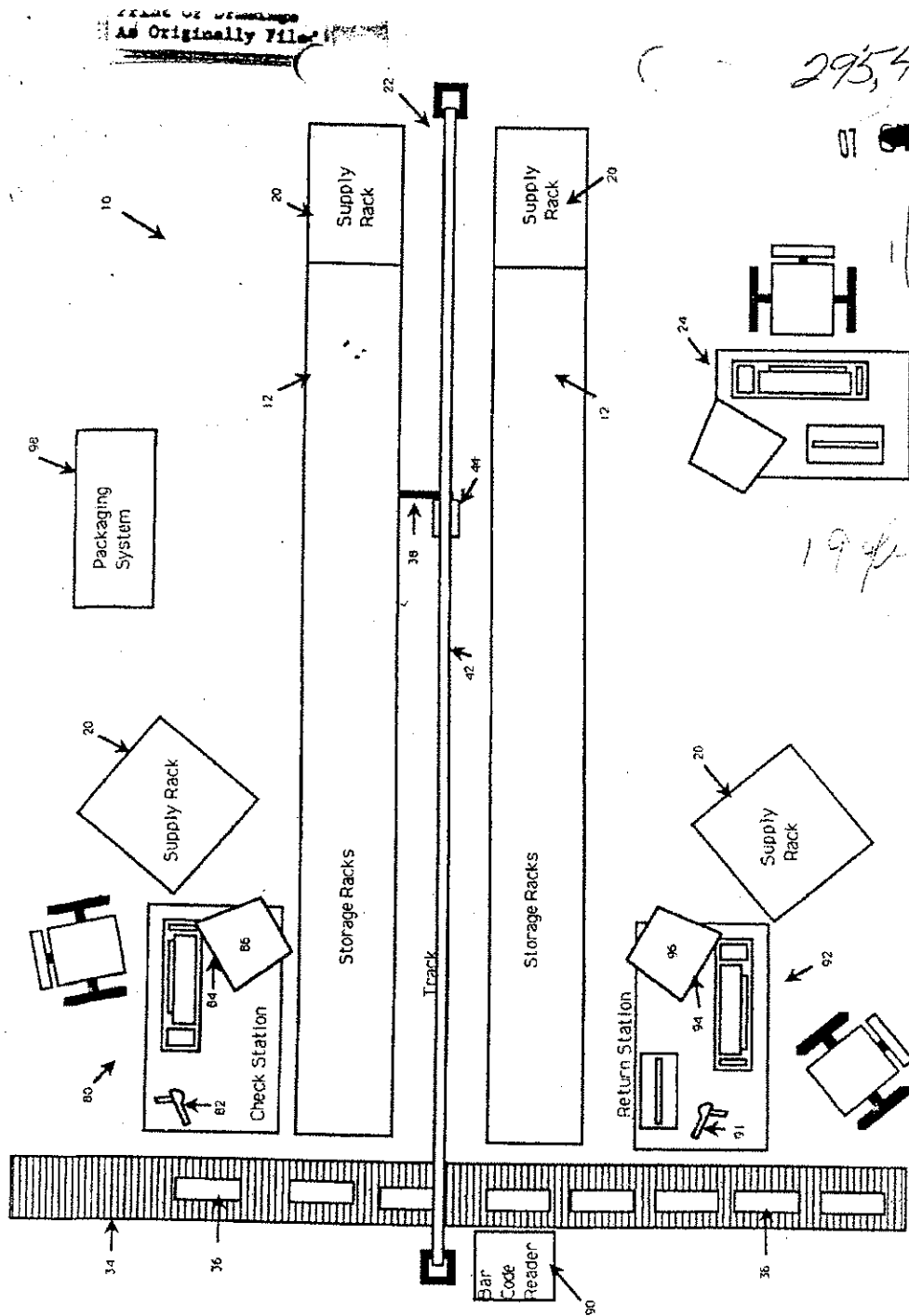


Figure 1

FIGURE 2
As Originally Filed

07 871832

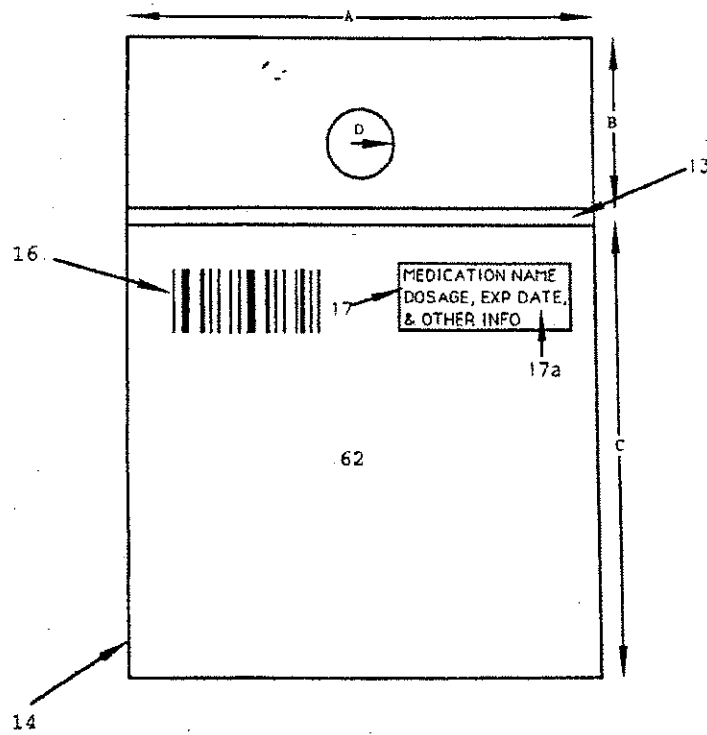


Figure 2

As Originally Filed

07 871832

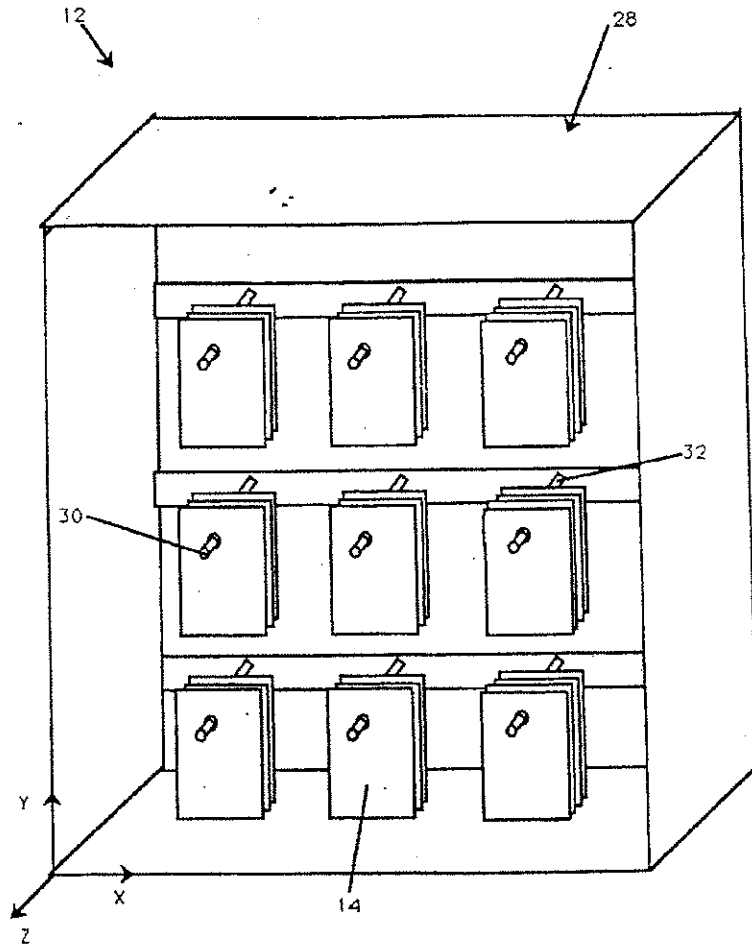


Figure 3

As Originally Filed

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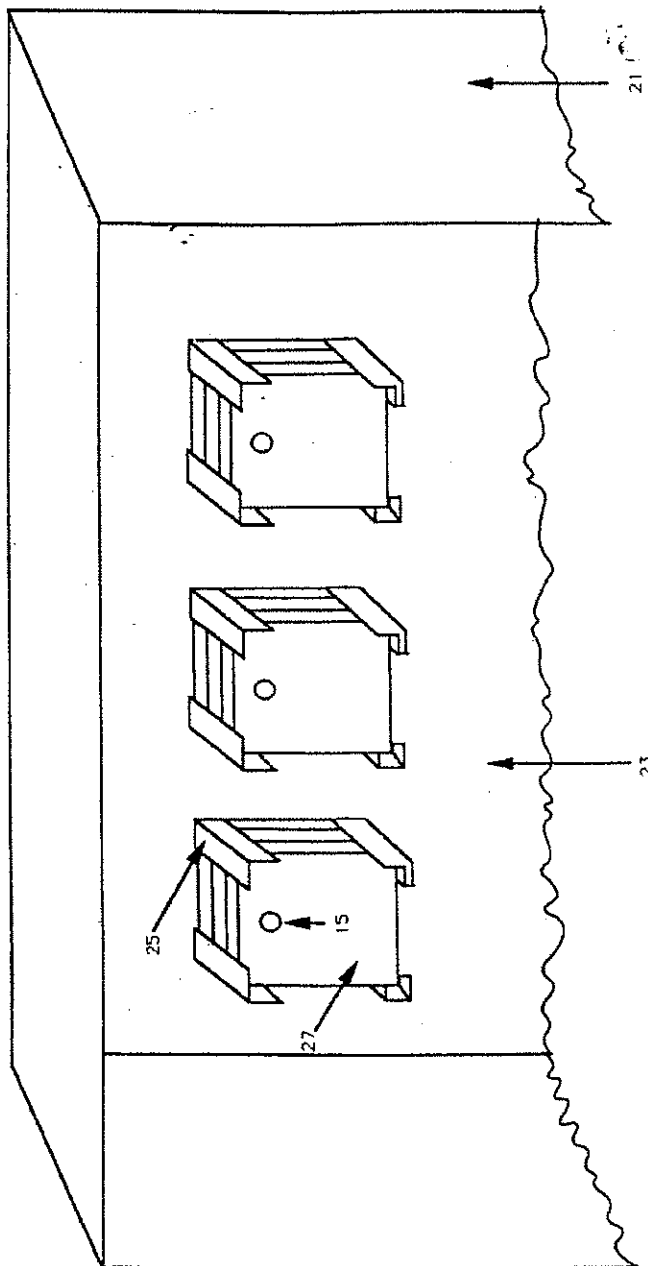


Figure 4

FILED OF DRAWINGS
As Originally Filed

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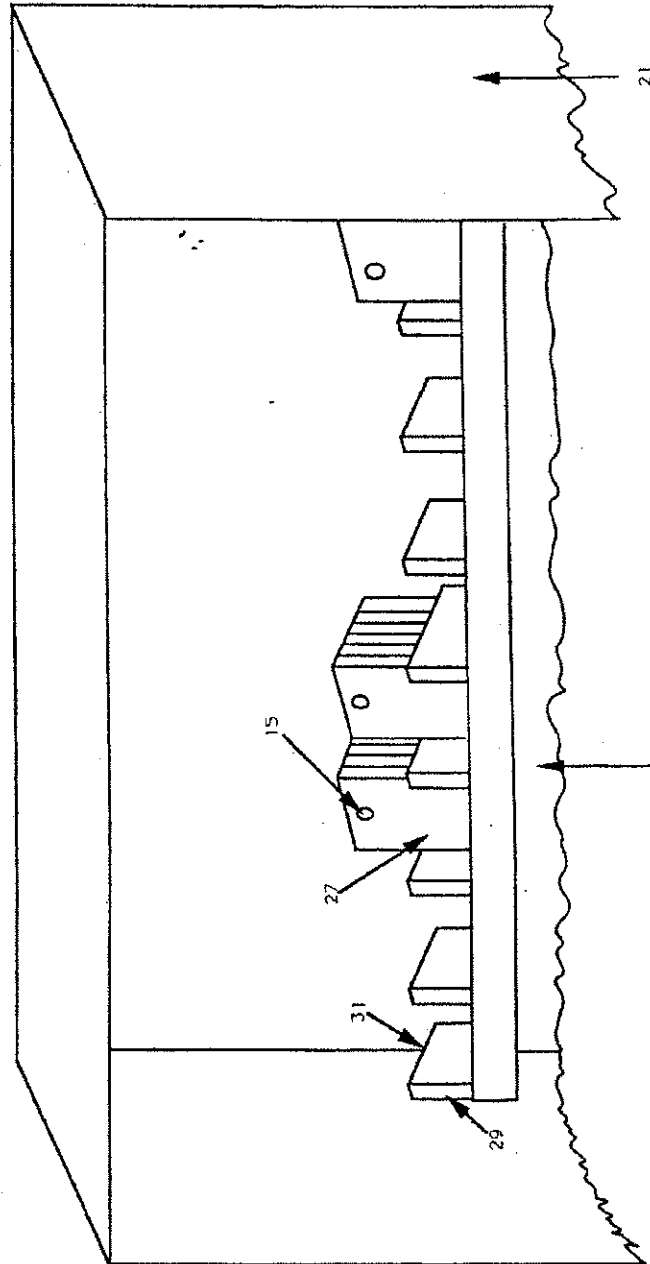


Figure 5

Print of Drawings
As Originally Filed

07 871832

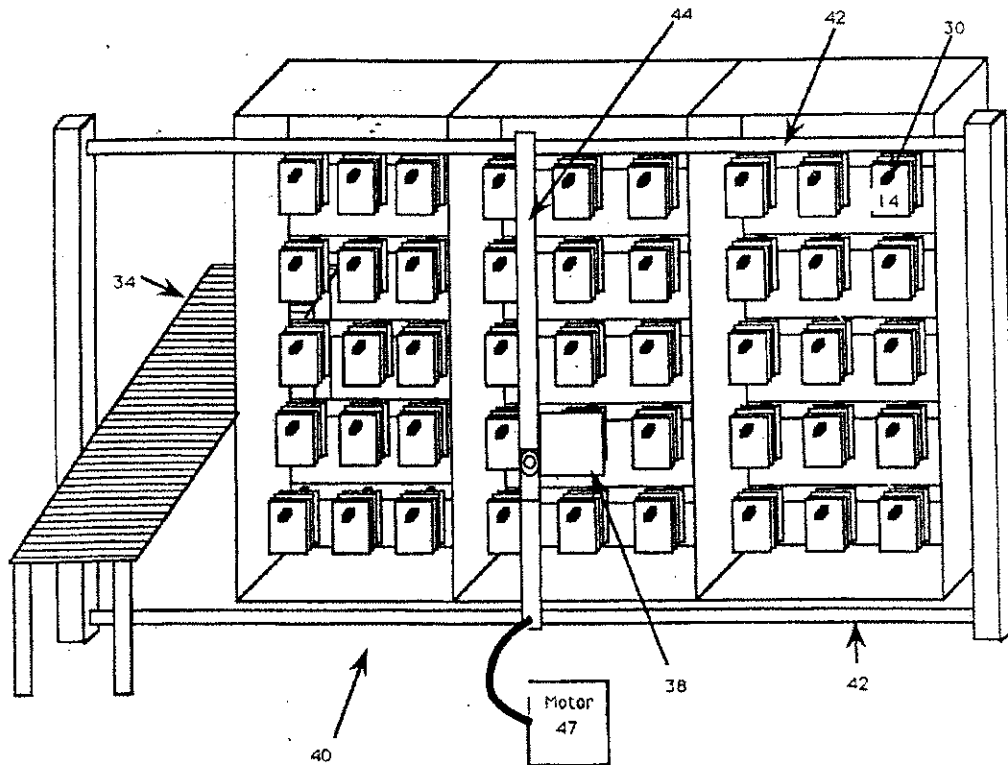


Figure 6

PLATE OF DRAWINGS
As Originally Filed

07 871832

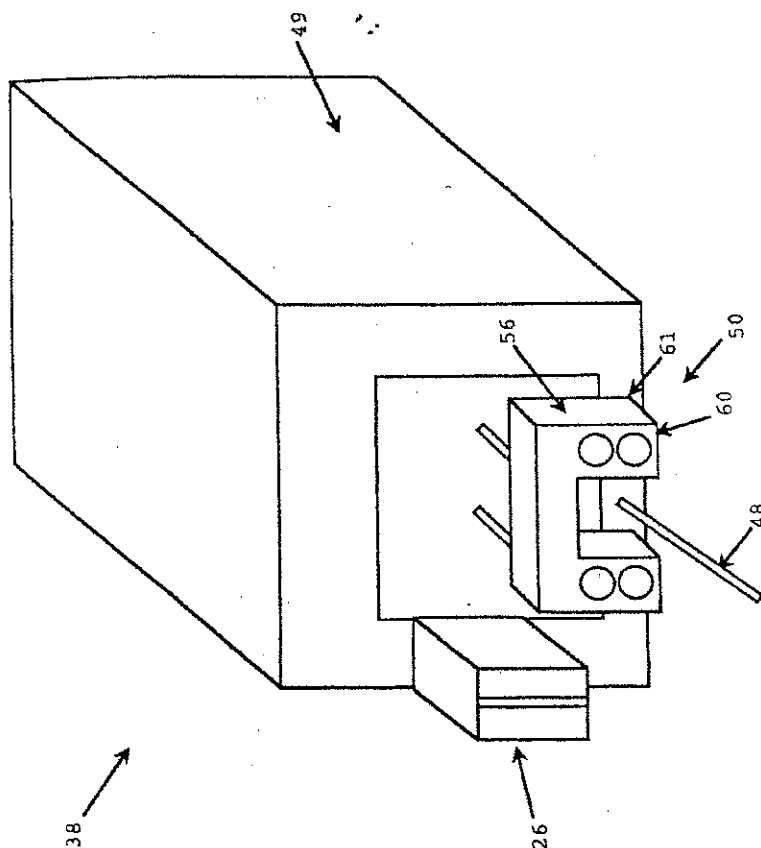


Figure 7

FILED BY DEPARTMENT
As Originally Filed

01 871832

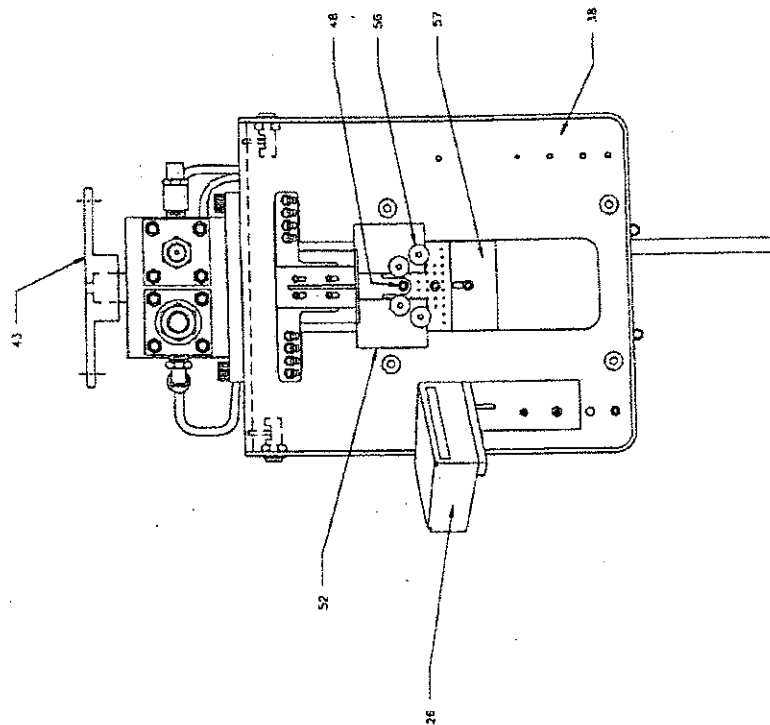


FIGURE 8

FRONT OF DRAWINGS
As Originally Filed

07 871832

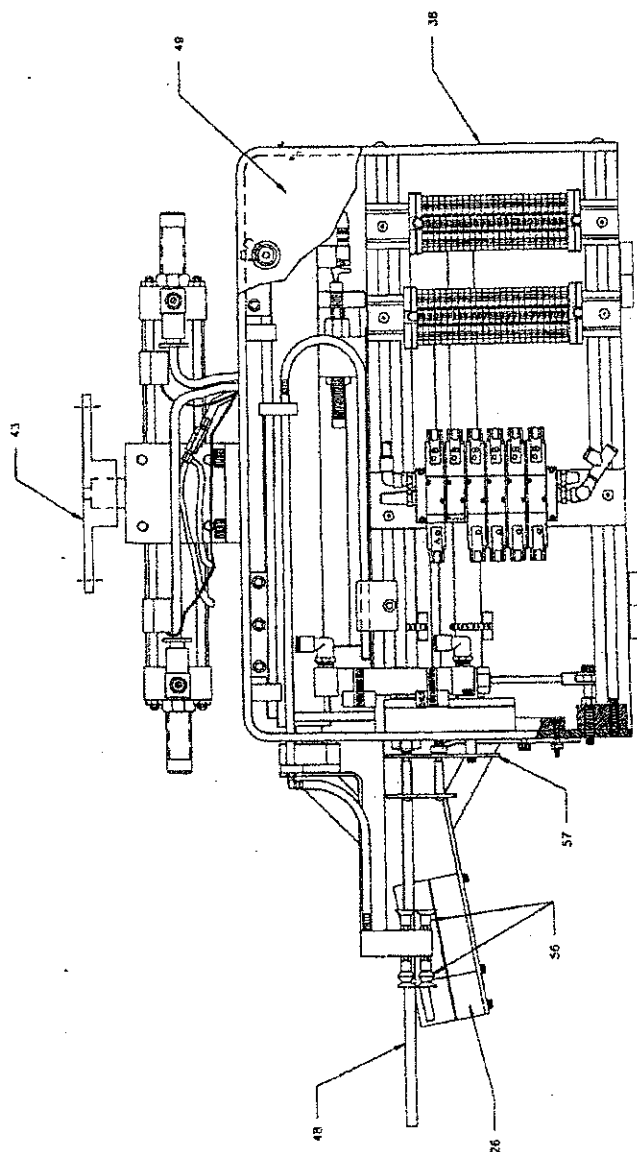


FIGURE 9

PRINT OF Drawings
As Originally Filed

07 871832

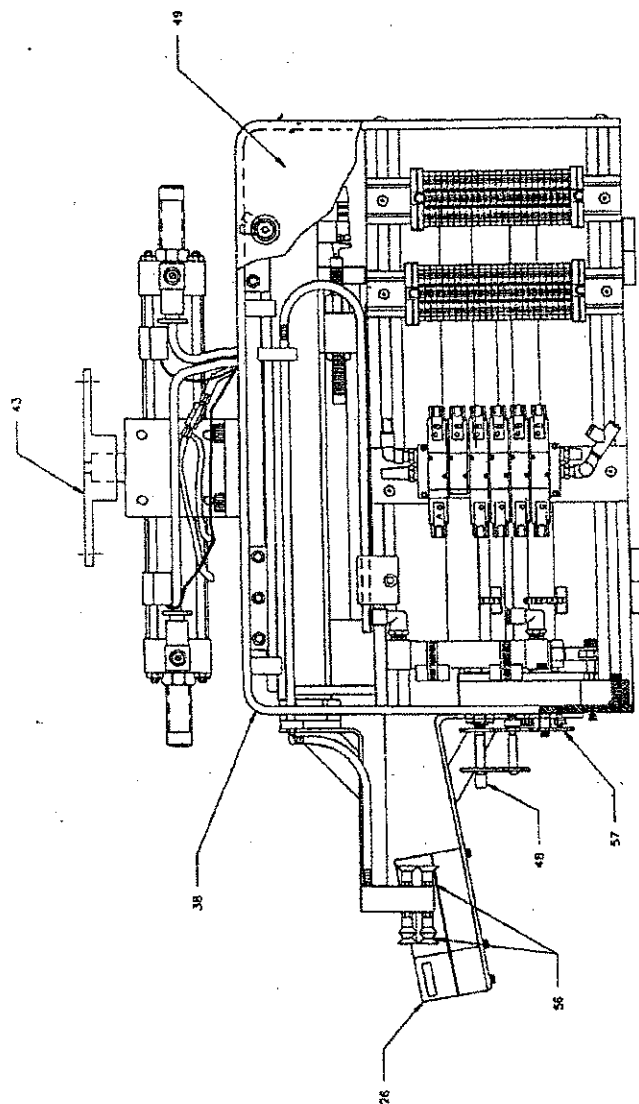


FIGURE 10

Print of Drawings
As Originally Filed

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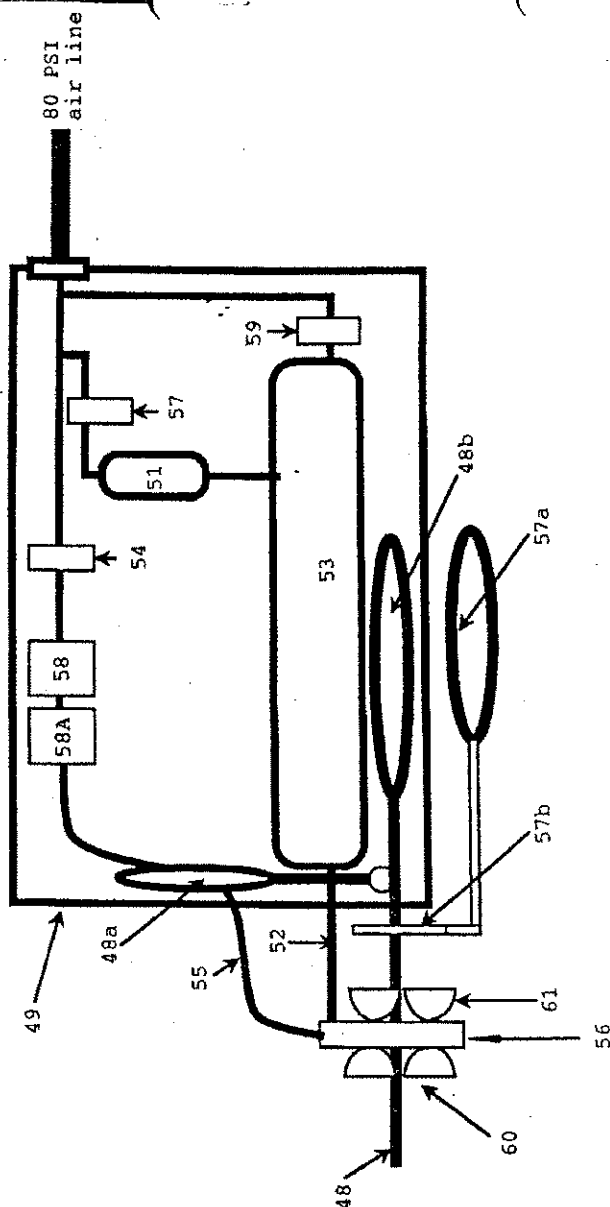


Figure 11

Print of Drawings
As Originally Filed

07 871832

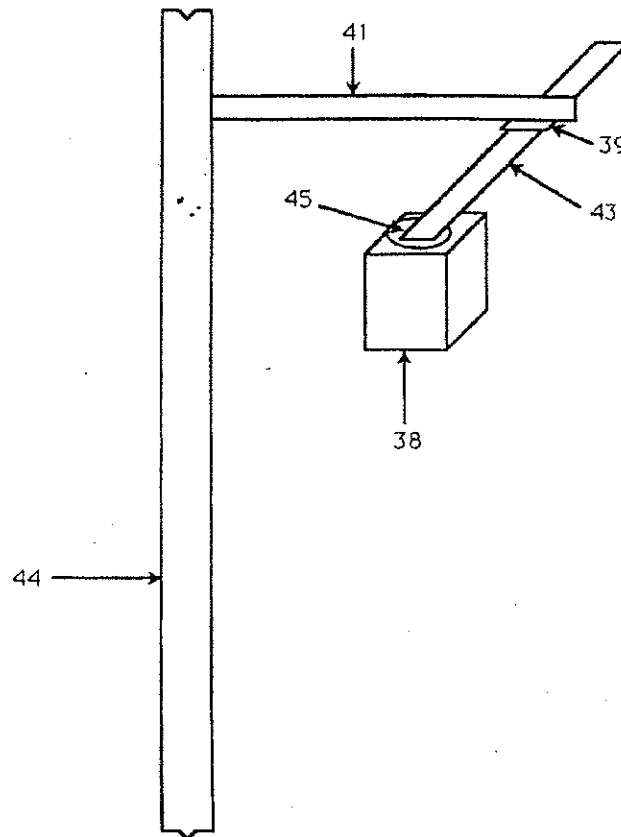


Figure 12

FIGURE 13
As Originally Filed

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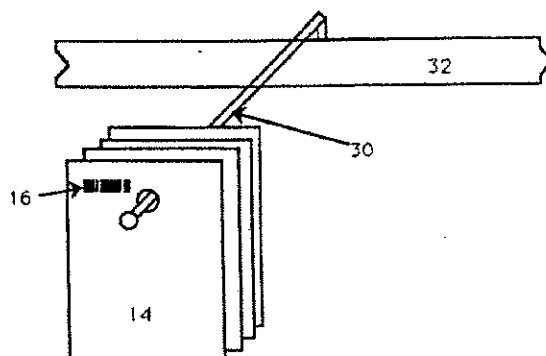


Figure 13

FIGURE 14
As Originally Filed

07 871832

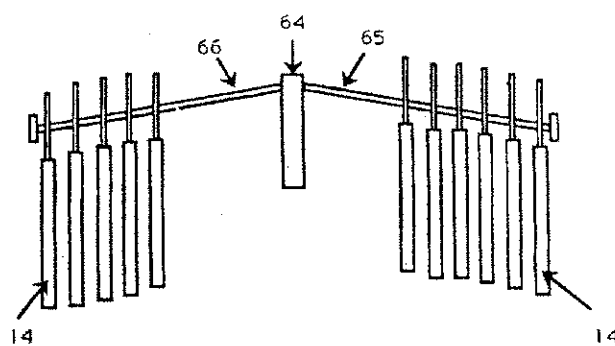
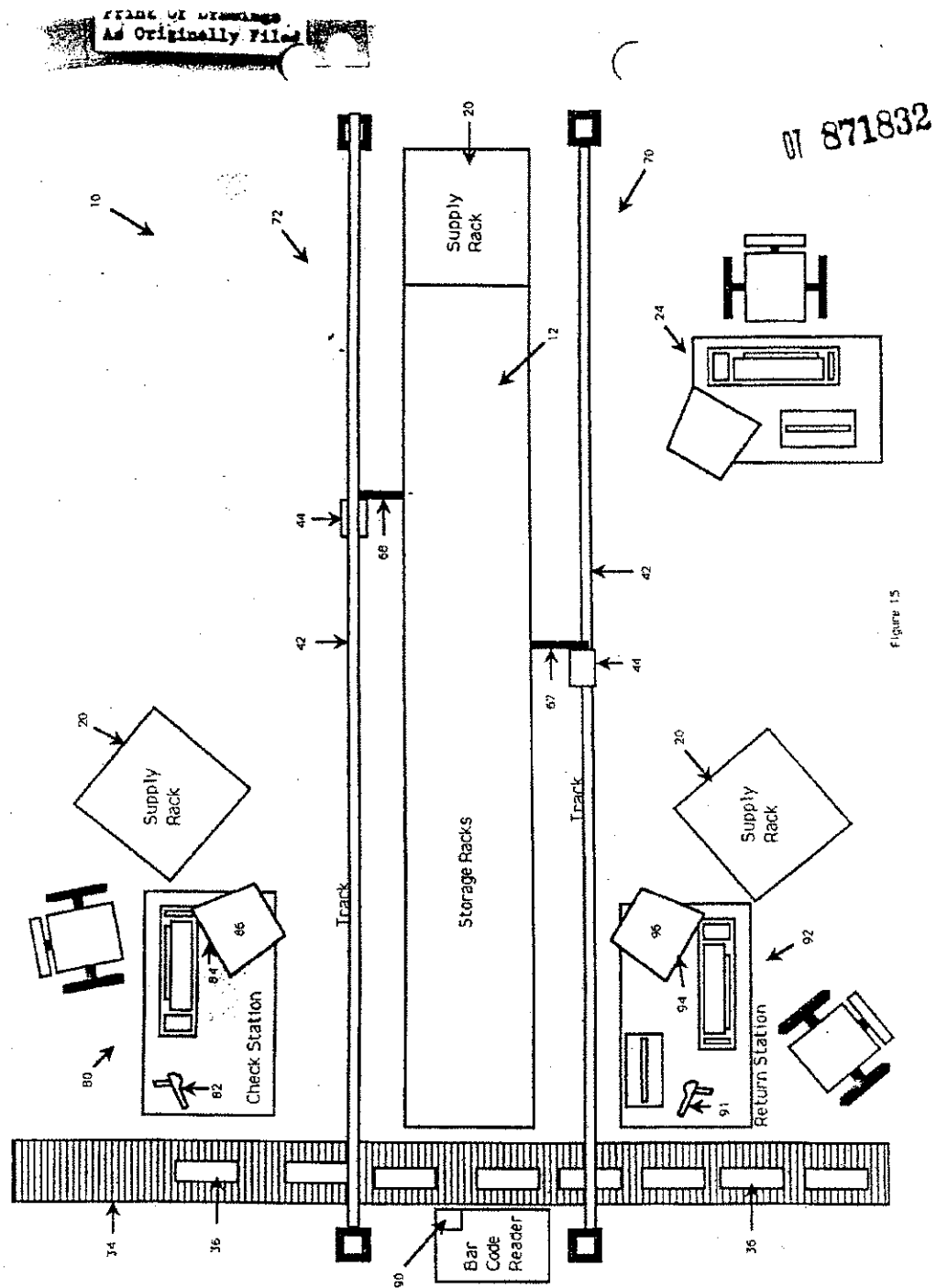


Figure 14



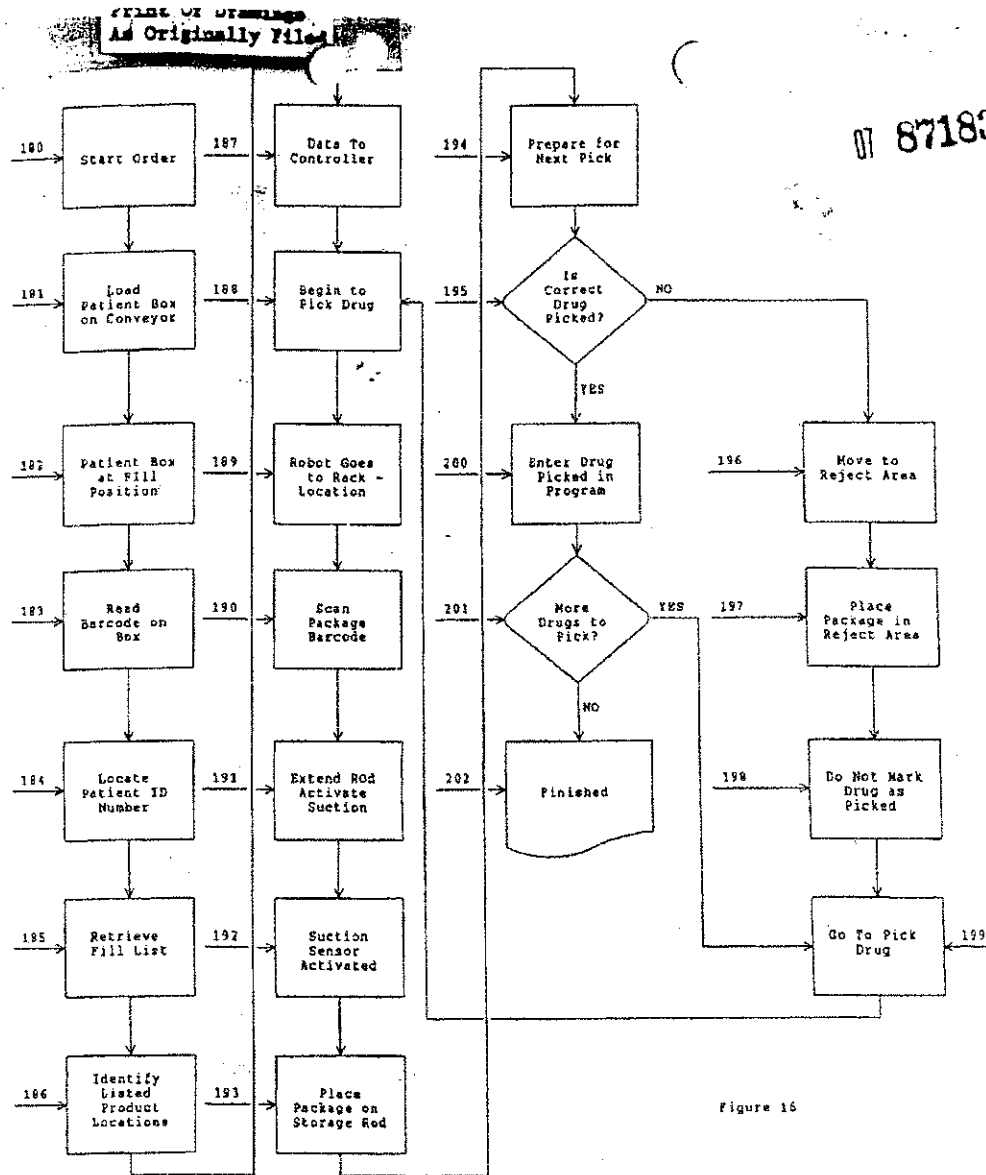
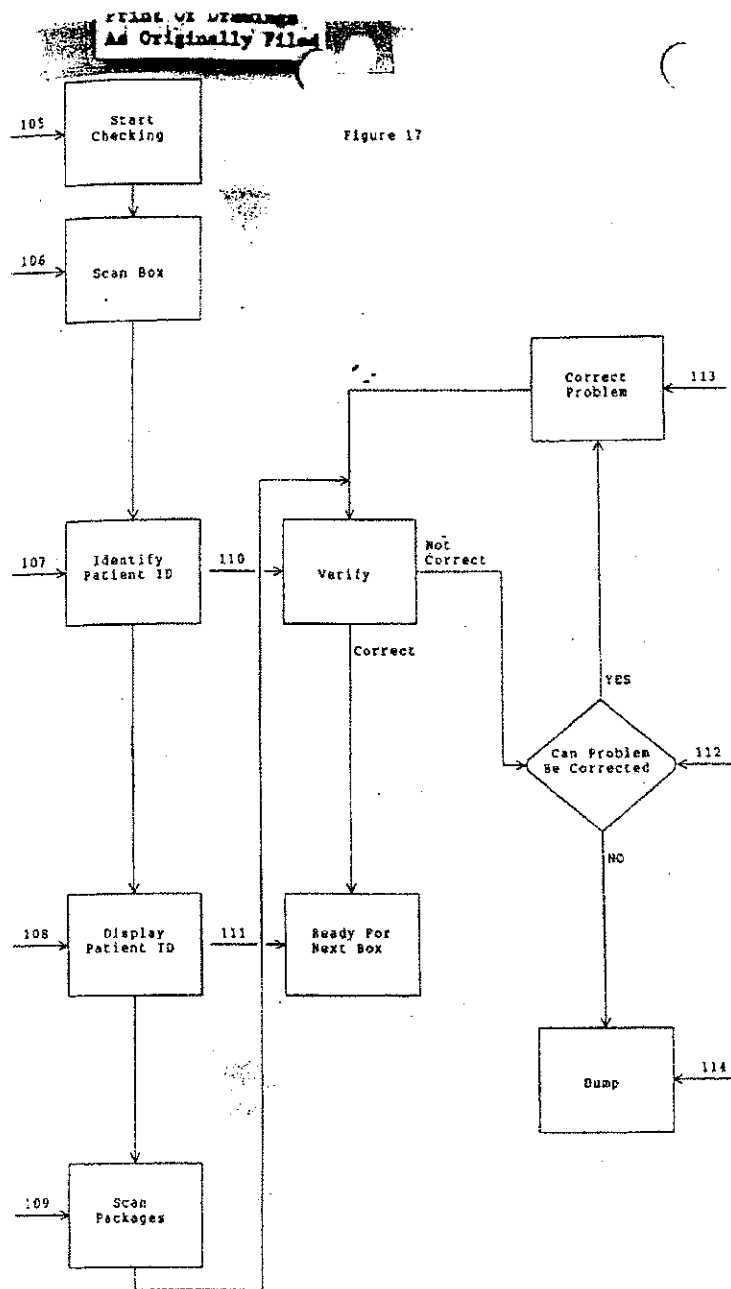
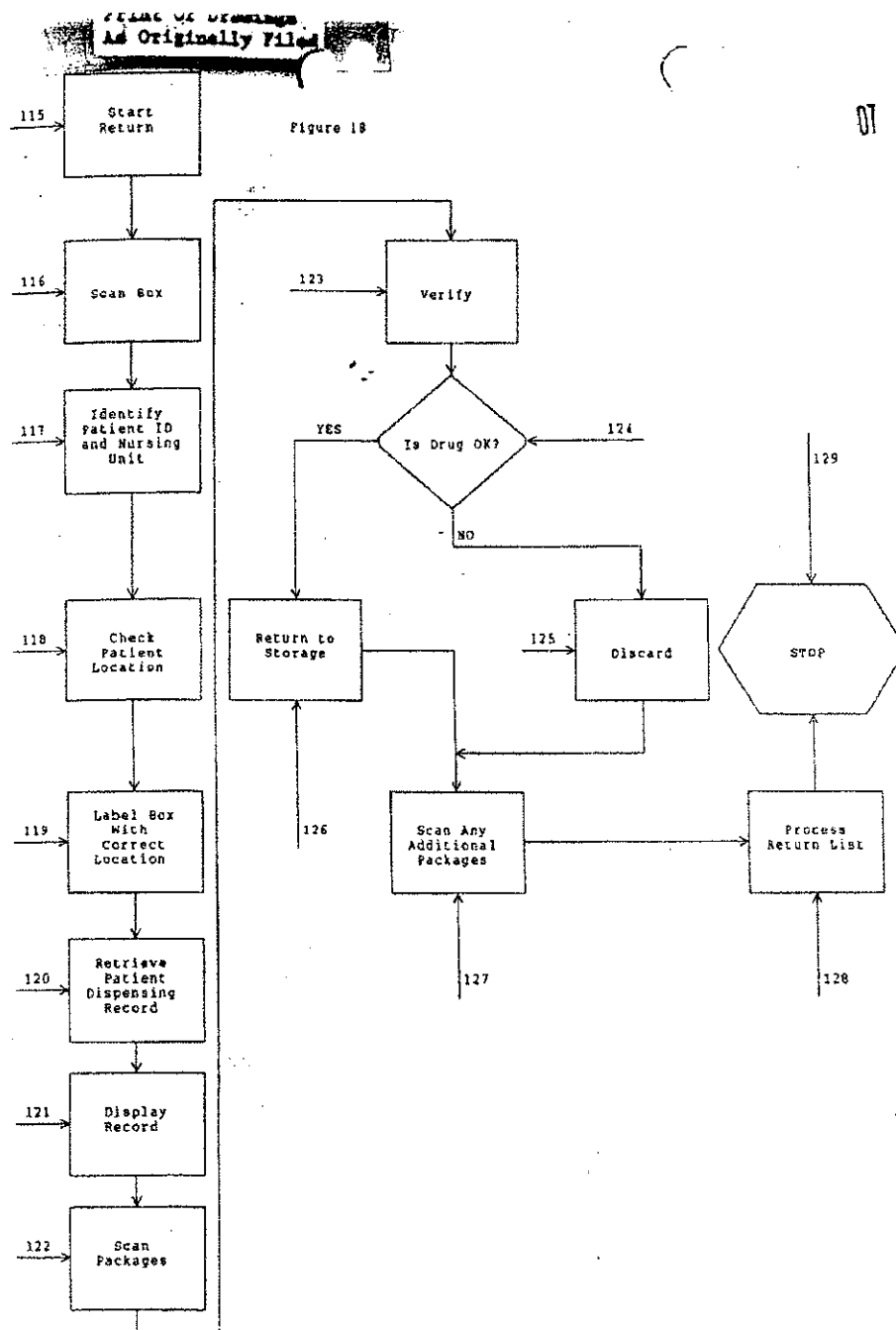
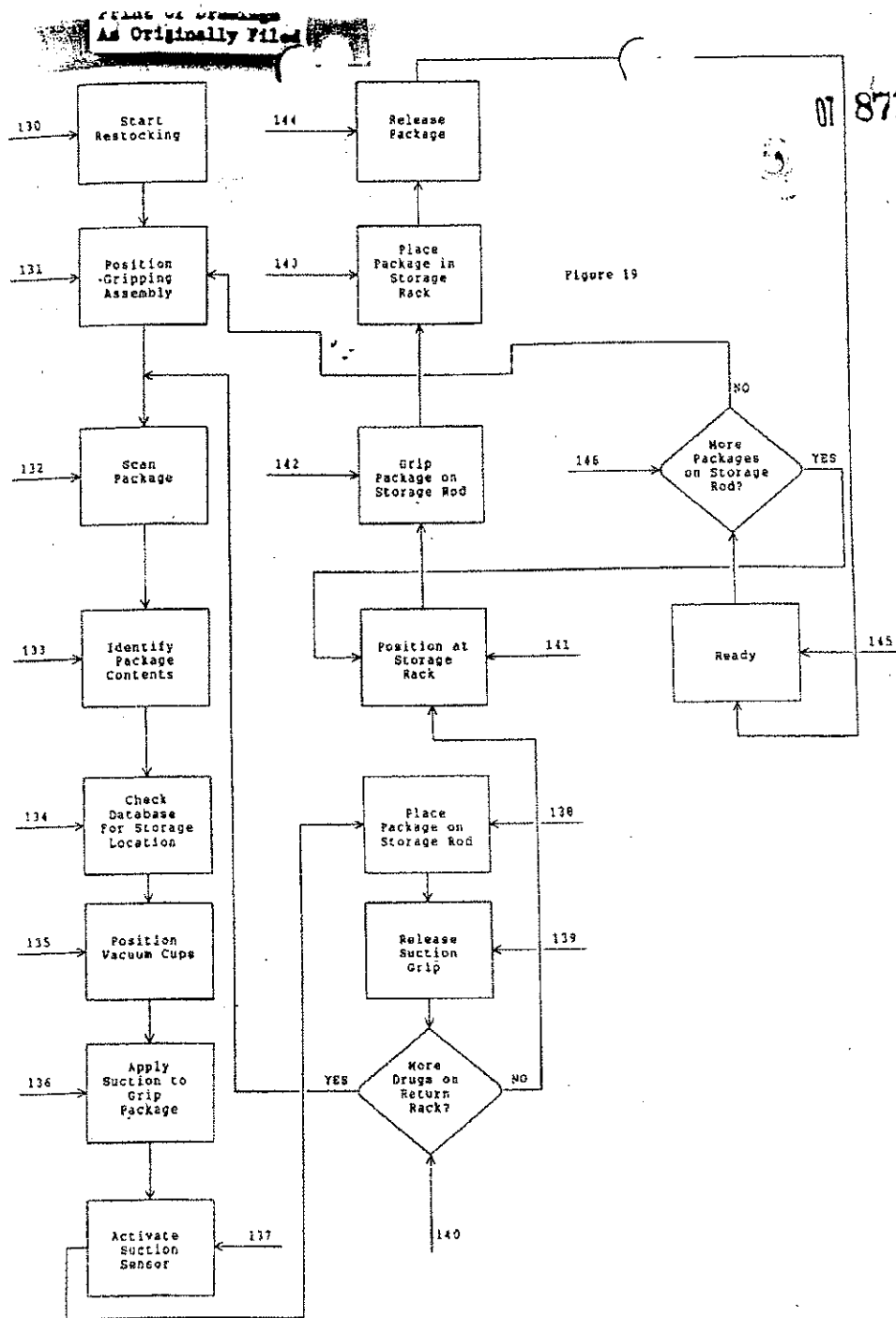


Figure 16








**UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office**

 Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY DOCKET NO./TITLE
07/871,832	04/21/92	MCDONALD	S 920015

 LYNN J. ALSTADT
BUCHANAN INGERSOLL PROFESSIONAL CORP.
56TH FLOOR, 600 GRANT ST.
PITTSBURGH, PA 15219

0000

DATE MAILED: 05/11/92

**NOTICE TO FILE MISSING PARTS OF APPLICATION
FILING DATE GRANTED**

A filing date has been granted to this application. However, the following parts are missing.

If all missing parts are filed within the period set below, the total amount owed by applicant as a

☐ large entity, ☒ small entity (verified statement filed), is \$ 65.00.

1. ☐ The statutory basic filing fee is: ☐ missing ☐ insufficient. Applicant as a ☐ large entity
☐ small entity, must submit \$ _____ to complete the basic filing fee and MUST ALSO
 SUBMIT THE SURCHARGE AS INDICATED BELOW.
2. ☐ Additional claim fees of \$ _____ as a ☐ large entity ☐ small entity, including any required multiple
 dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional
 claims for which fees are due. NO SURCHARGE IS REQUIRED FOR THIS ITEM.
3. ☐ The oath or declaration:
☐ is missing.
☐ does not cover items omitted at time of execution.
 An oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application
 Number and Filing Date is required. A SURCHARGE MUST ALSO BE SUBMITTED AS INDICATED
 BELOW.
4. ☐ The oath or declaration does not identify the application to which it applies. An oath or declaration in
 compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date
 is required. A SURCHARGE MUST ALSO BE SUBMITTED AS INDICATED BELOW.
5. ☐ The signature to the oath or declaration is: ☐ missing; ☐ a reproduction; ☐ by a person other than the
 inventor or a person qualified under 37 CFR 1.42, 1.43, or 1.47. A properly signed oath or declaration in
 compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date
 is required. A SURCHARGE MUST ALSO BE SUBMITTED AS INDICATED BELOW.
6. ☒ The signature of the following joint inventor(s) is missing from the oath or declaration:
L. J. Alstadt + J. H. H. An oath or declaration listing the names of all inventors and signed by
 the omitted inventor(s), identifying this application by the above Application Number and Receipt Date is
 required. A SURCHARGE MUST ALSO BE SUBMITTED AS INDICATED BELOW.
7. ☐ The application was filed in a language other than English. Applicant must file a verified English
 translation of the application and a fee of \$30.00 under 37 CFR 1.17(k), unless this fee has already been
 paid. NO SURCHARGE IS REQUIRED FOR THIS ITEM.
8. ☐ A \$50.00 processing fee is required for returned checks. (37 CFR 1.21(m)).
9. ☐ Your filing receipt was mailed in error because check was returned without payment.
10. ☐ Other.

150.00 65.00
An Application Number and Filing Date have been assigned to this application. The missing parts and fees
 identified above in items 1 and 3-6 must be timely provided ALONG WITH THE PAYMENT OF A
 SURCHARGE of ~~\$100.00~~ for large entities or ~~\$60.00~~ for small entities who have filed a verified statement
 claiming such status. The surcharge is set forth in 37 CFR 1.16(e). Applicant is given ONE MONTH FROM
 THE DATE OF THIS LETTER, OR TWO MONTHS FROM THE FILING DATE of this application,
 WHICHEVER IS LATER, within which to file all missing parts and pay any fees required above to avoid
 abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee
 under the provisions of 37 CFR 1.136(a).

 Direct the response to, and any questions about, this notice to ATTENTION: Application Division,
 Special Handling Unit.

A copy of this notice MUST be returned with response.

 For: Manager, Application Division
 (703) 537-308-1409

MA000178



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of :
SEAN McDONALD et al. : AN AUTOMATED SYSTEM
Serial No. 07/871,832 : FOR SELECTING AND
Filed April 21, 1992 : DELIVERING PACKAGES FROM
A STORAGE AREA

LETTER

Pittsburgh, Pennsylvania 15219

June 22, 1992

Hon. Commissioner of Patents and Trademarks

Washington, D.C. 20231

Sir:

This is in response to the Notice to File Missing Parts of Application mailed May 11, 1992. Submitted herewith is an original supplemental Declaration and Power of Attorney signed by the four inventors of the above-identified patent application. A check in the amount of \$65.00 is also enclosed to cover the surcharge fee. Any additional fees may be charged against deposit account No. 02-4553.

Respectfully submitted,

BUCHANAN INGERSOLL, P.C.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231,
on

June 22, 1992

Buchanan Ingersoll

By

Lynn J. Alstadt
Lynn J. Alstadt

Registration No. 29,362

Attorneys for Applicants

(412) 562-1632

MA000179

Docket No. 920015

DECLARATION AND POWER OF ATTORNEY

I, the below named inventor, hereby declare that:

My residence, post office address and citizenship is as stated below next to my respective name.

I believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled "AN AUTOMATED SYSTEM FOR SELECTING AND DELIVERING PACKAGES FROM A STORAGE AREA," the specification of which was filed on April 21, 1992, and bears Serial No. 07/871,832.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a).

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing of this application.

<u>Application Serial No.</u>	<u>Filing Date</u>	<u>Status</u> (Patented, Pending, Abandoned)
<u>07/469,217</u>	<u>1/24/90</u>	<u>Abandoned</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

I hereby declare that all statements made hereby of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby appoint the following attorney(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith: Lynn J. Alstadt, Reg. No. 29,362; George P. Baier, Reg. No. 26,717; Paul A. Beck, Reg. No. 22,289; Michael L. Dever, Reg. No. 32,216; Craig N. Killen, Reg. No. 35,218; George Raynovich, Jr., Reg. No. 19,829 and Alvin E. Ring, Reg. No. 18,697.

Address all telephone calls to: Lynn J. Alstadt

Address all correspondence to: Buchanan Ingersoll Professional Corporation,
56th Floor, 600 Grant Street
Pittsburgh, Pennsylvania 15219
(412) 662-1632

1-00

Full name of sole or first inventor Sean C. McDonald
Inventor's Signature *Sean C. McDonald* Date 6-19-92
Residence Pittsburgh, Allegheny County, Pennsylvania Pa Citizenship USA
Post Office Address 419 South Braddock Avenue, Pittsburgh, Pennsylvania 15221

2-00

Full name of second joint inventor, if any Ellen J. Hertz
Inventor's Signature *Ellen J. Hertz* Date 6-8-92
Residence Clemmons, Forsyth County, North Carolina NC Citizenship USA
Post Office Address 4232 Lake Cliff Drive, Clemmons, North Carolina 27012

3-00

Full name of third joint inventor, if any James A. Smith
Inventor's Signature *James A. Smith* Date 6/19/92
Residence Allison Park, Allegheny County, Pennsylvania Pa Citizenship USA
Post Office Address 3909 Ash Drive, Allison Park, Pennsylvania 15101

4-00

Full name of fourth joint inventor, if any Gregory Toto
Inventor's Signature *Gregory Toto* Date 6/18/92
Residence Santa Cruz, Santa Cruz County, California Ca Citizenship USA
Post Office Address 815B Corcoran Avenue, Santa Cruz, California 95062

Full name of fifth joint inventor, if any _____
Inventor's Signature _____ Date _____
Residence _____ Citizenship _____
Post Office Address _____



65-205 A/N
 UNITED STATES DEPARTMENT OF COMMERCE
 Patent and Trademark Office
 Address: COMMISSIONER OF PATENTS AND TRADEMARKS
 Washington, D.C. 20231

FILING DATE

FIRST NAMED APPLICANT

ATTY DOCKET NO./TITLE

07/03/92

04/11/92

PROUDMAN, J.

8

92001

#3

1. THE INVENTOR
 BUCHHEIM, CAROL ANN, PROFESSIONAL CORP.
 10000 100TH AVE. N.E.
 STE 1000, BELLEVUE, WA 98004

DATE MAILED:

05/11/92

NOTICE TO FILE MISSING PARTS OF APPLICATION FILING DATE GRANTED

RECEIVED

JUN 30 1992

APPLICATION BRANCH

A filing date has been granted to this application. However, the following parts are missing.

If all missing parts are filed within the period set below, the total amount owed by applicant as a

☐ large entity, ☐ small entity (verified statement filed), is \$ 65.00.

1. ☐ The statutory basic filing fee is: ☐ missing ☐ insufficient. Applicant as a ☐ large entity ☐ small entity, must submit \$ _____ to complete the basic filing fee and **MUST ALSO SUBMIT THE SURCHARGE AS INDICATED BELOW.**
2. ☐ Additional claim fees of \$ _____ as a ☐ large entity ☐ small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due. **NO SURCHARGE IS REQUIRED FOR THIS ITEM.**
3. ☐ The oath or declaration:
 - ☐ is missing.
 - ☐ does not cover items omitted at time of execution.

An oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date is required. A SURCHARGE MUST ALSO BE SUBMITTED AS INDICATED BELOW.

4. ☐ The oath or declaration does not identify the application to which it applies. An oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date is required. A SURCHARGE MUST ALSO BE SUBMITTED AS INDICATED BELOW.
5. ☐ The signature to the oath or declaration is: ☐ missing; ☐ a reproduction; ☐ by a person other than the inventor or a person qualified under 37 CFR 1.42, 1.43, or 1.47. A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date is required. A SURCHARGE MUST ALSO BE SUBMITTED AS INDICATED BELOW.
6. ☒ The signature of the following joint inventor(s) is missing from the oath or declaration: ILLIUM, INC.. An oath or declaration listing the names of all inventors and signed by the omitted inventor(s), identifying this application by the above Application Number and Receipt Date is required. A SURCHARGE MUST ALSO BE SUBMITTED AS INDICATED BELOW.
7. ☐ The application was filed in a language other than English. Applicant must file a verified English translation of the application and a fee of \$30.00 under 37 CFR 1.17(k), unless this fee has already been paid. **NO SURCHARGE IS REQUIRED FOR THIS ITEM.**
8. ☐ A \$50.00 processing fee is required for returned checks. (37 CFR 1.21(m)).
9. ☐ Your filing receipt was mailed in error because check was returned without payment.
10. ☐ Other.

An Application Number and Filing Date have been assigned to this application. The missing parts and fees identified above in items 1 and 3-6 must be timely provided **ALONG WITH THE PAYMENT OF A SURCHARGE** of \$120.00 for large entities or \$60.00 for small entities who have filed a verified statement claiming such status. The surcharge is set forth in 37 CFR 1.16(e). Applicant is given **ONE MONTH FROM THE DATE OF THIS LETTER, OR TWO MONTHS FROM THE FILING DATE** of this application, **WHICHEVER IS LATER**, within which to file all missing parts and pay any fees required above to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

Direct the response to, and any questions about, this notice to **ATTENTION: Application Division, Special Handling Unit.**

A copy of this notice MUST be returned with response.

For: Manager, Application Division
 (703) 557-1112

1 205

65.00 CK

MA000182



THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of :
SEAN McDONALD et al. : AN AUTOMATED SYSTEM
Serial No. 07/871,832 : FOR SELECTING AND
Filed April 21, 1992 : DELIVERING PACKAGES FROM
A STORAGE AREA

RECEIVED

INFORMATION DISCLOSURE STATEMENT
UNDER 37 C.F.R. §1.56

JUL 28 1992

GROUP 230

Pittsburgh, Pennsylvania 15219

July 21, 1992

Hon. Commissioner of Patents and Trademarks

Washington, D.C. 20231

Sir:

The above-identified patent application is a continuation-in-part of Serial No. 07/469,217, now abandoned. Applicants advise the Office that the only pertinent prior art of which they are aware was cited in the parent application or its corresponding European counterpart. A copy of the European search report and references there cited is enclosed.

Respectfully submitted,

BUCHANAN INGERSOLL, P.C.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on

July 21, 1992

Buchanan Ingersoll

By

Lynn J. Alstadt

Registration No. 29,362

Attorneys for Applicants

(412) 562-1632

MA000183

SHEET 1 OF 1

FORM PTO-449
(Rev. 7-80)

U.S. Department of Commerce
Patent and Trademark Office

ATTY. DOCKET NO.
920015

SERIAL NO.
07/871,382

LIST OF PRIOR ART CITED BY APPLICANT
(Use separate sheets if necessary)

APPLICANT
Sean McDonald et al.

FILING DATE
April 21, 1992

GROUP
3A07

Part of Paper #4

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	IF APPROPRIATE
AA	3,986,612	10/76	Kamin et al.	209	111.7	
AB	4,687,390	7/87	Bonneton et al.	414	282	
AC						
AD						
AE						
AF						
AG						
AH						
AI						
AJ						
AK						

RECEIVED
JUL 28 1992
GROUP 230

FOREIGN PATENT DOCUMENTS

	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
AL	2 596 299	10/87	French				✓
AM	FR85/00232	8/84	PCT			✓	
AN							
AO							
AP							

OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)

AR		
AS		
AT		

EXAMINER
F.E. Werner

DATE CONSIDERED
9/93

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with PEP 809. Draw line through question if not in conformance and not considered. Include copy of this form with next communication to applicant.

EUROPEAN PATENT
OFFICE
Branch at
The Hague
Search
Division

OFFICE EUROPEEN
DES BREVETS
Département à
La Haye
Division de la
recherche

P.B. 5818 Patentlaan, 2
2280 HV RIJSWIJK (ZH)
Pays-Bas / Netherlands / Niederlande
Telex 31651
(070) 340-20 40
BREV/PATENT



Jones, Michael Raymond
HASELTINE LAKE & CO.
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GRANDE BRETAGNE

HASELTINE LAKE & CO.	
ACKNOWLEDGEMENT	
29 JUL 1991	
ORIGINAL	COPIES
COPY	

26.07.91

Zeichen/Ref./Ref. HLA2220/000/MRJ	Anmeldung Nr./Application No./Demande n°/Patent Nr./Patent No./Brevet n° 91300543.5-
Anmelder/Applicant/Demandeur/Patentinhaber/Proprietor/Titulaire AUTOMATED HEALTHCARE, INC.	

COMMUNICATION

The European Patent Office herewith transmits:

- ☒ the European search report
- ☐ the declaration under Rule 45 of the European Patent Convention
- ☐ the partial European search report under Rule 45 of the European Patent Convention
- ☐ the supplementary European search report concerning the international application number

relating to the above-identified European patent application; copies of the documents cited in the search report are enclosed.

The Search Division approved the following items, as submitted by the applicant:

- ☒ Abstract
- ☒ Title
- ☐ Figure

- ☐ The abstract was modified by the Search Division and the definitive text is attached to the present communication.
- ☒ The following figure will be published with the abstract, since the Search Division considers that it better characterises the invention than the one indicated by the applicant.

Figure:

- ☐ Additional copy(ies) of the documents cited in the European search report.

REFUND OF THE SEARCH FEE

If applicable under Art.10 of the Rules relating to fees, a separate communication from the Receiving Section on the refund of the search fee will be sent to you later.



EPO Form 1507 07.90

European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 91 30 0543

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	US-A-4 678 390 (BONNETON) * Column 6, lines 50-57; column 10, lines 33-47; column 13, lines 46-54; column 16, lines 3-12; figures *	1,19,20	B 65 G 1/137
Y		2,3,4,5	
A		,8,18 11,12, 21,22, 23	
Y	FR-A-2 596 299 (COMPAGNIE GENERALE D'AUTOMATISME CGA-HBS) * Page 6, line 28 - page 13, line 19; figures *	2,3,4,5 ,8,18	
A	US-A-3 986 612 (KAMM) * Column 1, lines 32-46; figures *	1,22	
X		19	
A	WO-A-B 601 386 (SOCIETE VYNEX) * Page 11, lines 3-13; figures *	6,21	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 65 G G 06 F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 26-06-1991	Examiner OSTYN T.J.M.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons A : member of the same patent family, corresponding document			

EPO FORM 150 (01/91) (P.0401)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 91 30 0543

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on 17/07/91. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 4678390	07-07-87	EP-A,B 0235488	09-09-87
FR-A- 2596299	02-10-87	US-A- 4874281	17-10-89
		US-A- 4971513	20-11-90
US-A- 3986612	19-10-76	None	
WO-A- 8601386	13-03-86	FR-A- 2569548	07-03-86
		AU-A- 4775185	24-03-86
		CA-A- 1240769	16-08-88
		DE-A- 3562863	30-06-88
		EP-A,B 0192690	03-09-86
		US-A- 4797819	10-01-89

EP 91 30 0543

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

GP 310



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit 3101 : PATENT APPLICATION
In re application of :
SEAN MCDONALD ET AL. : AN AUTOMATED SYSTEM
Serial No. 871,832 : FOR SELECTING AND
Filed April 21, 1992 : DELIVERING PACKAGES FROM A
STORAGE AREA

STATUS LETTER

Pittsburgh, Pennsylvania 15219

September 23, 1993

Hon. Commissioner of Patents and Trademarks
Washington, D. C. 20231

Sir:

Please advise us of the status of the above-identified
patent application.

Respectfully submitted,

Lynn J. Alstadt
Lynn J. Alstadt
Registration No. 29,362
BUCHANAN INGERSOLL, P.C.
56th Floor, 600 Grant Street
Pittsburgh, Pennsylvania 15219

(412) 562-1632

Status Letter
Expected date for
action on this application
with action of 10/93
Mo. Yr.

Frank E. Werner
Examiner

FRANK E. WERNER
PRIMARY EXAMINER

MA000188

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

McDONALD

F 1M1/1015

INVESTMENT MANAGEMENT PROFESSIONAL CORP.
10000 BAYVIEW BLVD. SUITE 100
BAYVIEW, MI 48064

3-920015
EXAMINER

WEINER, F.

ART UNIT	PAPER NUMBER
----------	--------------

3107
DATE MAILED:

10/15/93

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

- ☒ This application has been examined ☐ Responsive to communication filed on _____ ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 15 month(s), 15 day(s) from the date of this letter. Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☒ Notice of References Cited by Examiner, PTO-892.
2. ☒ Notice re Patent Drawing, PTO-848.
3. ☒ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of Informal Patent Application, Form PTO-152.
5. ☐ Information on How to Effect Drawing Changes, PTO-1474.
6. ☒ Status Letter (Sept. 28, 1993)

Part II SUMMARY OF ACTION

- ### EXAMINER'S ACTION

Serial No. 871832

-2-

Art Unit 317

-PART III-

1. Restriction to one of the following inventions is required under 35 U.S.C. § 121:

I. Claims 1-23 and 36, drawn to a storage area (with X-Y coordinates, automated picking means and a computer subcombination, classified in Class 414, subclass 273.

II. Claims 24-35, drawn to a holding means, supply means, picking means and a computer combination, classified in Class 414, subclass 281.

2. The inventions are distinct, each from the other because of the following reasons:

3. Inventions II and I are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations. (M.P.E.P. § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because at least base claim 1 (of the Group II invention) can have a non-gripping support picking means and can have the support rods in a non-X-Y arrangement. The subcombination has separate utility such as being utilized alone or in combinations.

4. Because these inventions are distinct for the reasons given

Serial No. 871832

-3-

Art Unit 317

above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

5. During a telephone conversation with Mr. Alstadt on Sept. 30, 1993 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-23 and 36. Affirmation of this election must be made by applicant in responding to this Office action. Claims 24-35 are withdrawn from further consideration by the Examiner, 37 C.F.R. § 1.142(b), as being drawn to a non-elected invention.

6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 C.F.R. § 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a diligently-filed petition under 37 C.F.R. § 1.48(b) and by the fee required under 37 C.F.R. § 1.17(h).

7. Claims 1-23 and 36 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A double inclusion of structure is present re "automated picking means "(claim 1, line 9), "a computer" (claim 1, line

Serial No. 871832

-4-

Art Unit 317

15), "storage area locations" (claim 1, lines 11 and 12), "a package" (claim 3, line 2), "automated picking means" (claim 9, line 6), and "in memory" (claim 21, line 24). No antecedent basis exists for "the first or second holding means" (claim 36, lines 8 and 9). Further, re claim 1, it is not understood what the storage area locations are structurally comprised of; also, no means has been claimed to move the picking means; lastly, it is not clear how the types are distinguished from each other. Re claims 9 and 10, no means has been set forth to move the supply station and it is not clear as to what the supply station is structurally comprised of.

8. The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered

Serial No. 871832

-5-

Art Unit 317

therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103.

10. Claims 1, 7, 9, 10, 12-14, 22 and 23 are rejected under 35 U.S.C. § 103 as being unpatentable over Morello et al.

Morello et al disclose storage areas 40, automated picking means 20, 62, etc. on tracks 98 (99) and computer means 16 to assign the package to X-Y coordinates (column 11, lines 11-17) and to control the picking means. It would have been obvious to have operated the system in the claimed manner. Re claim 9, note supply station 22. It would have been an obvious and conventional extension of Morello et al's matrix to have included a matrix supply station. Re claims 12 & 13, it would have been obvious to have programmed the computer in the claimed manner, if desired. Re claim 14, it would have been obvious to have included a conveyor to minimize manual intervention. Re claim 22, it would have been obvious to have handled medicine packages, if desired.

Re claim 10, the use of a conventional movable supply station to lend flexibility to the system would have been obvious.

11. Claims 3 & 2 are rejected under 35 U.S.C. § 103 as being unpatentable over Morello et al as applied to claims 1, 7, 9, 10, 12-14, 22 and 23 above, and further in view of Boucher, Jr. et al

Serial No. 871832

-6-

Art Unit 317

or Pohjonen. Boucher, Jr. et al (62,64) or Pohjonen et al (Sa) disclose and render obvious the substitution of a vacuum head. Re claim 3, Boucher, Jr. et al (24,26) teach that it would have been obvious to have included a sensor for the package.

12. Claims 4-6 are rejected under 35 U.S.C. § 103 as being unpatentable over Morello et al as applied to claims 1, 7, 9, 10, 12-14, 22 & 23 above, and further in view of O'Neil et al.

O'Neil et al (100,102, 97) teach and render obvious the use of a machine readable label to identify the contents. That the reader be conventionally attached to the gripper would have been obvious. Re claim 6, it would have been obvious to have included any relevant information on the label, including an expiration date.

13. Claims 8 & 11 are rejected under 35 U.S.C. § 103 as being unpatentable over Morello et al as applied to claims 1, 7, 9, 10, 12-14, 22 & 23 above, and further in view of the European Patent.

It would have been obvious to have substituted rods and holes in the package as taught by the European Patent (1,15, etc.)

14. Claim 15 is rejected under 35 U.S.C. § 103 as being unpatentable over Morello et al as applied to claims 1, 7, 9, 10, 12-14, 22 and 23 above, and further in view of Buttarazzi.

Buttarazzi (42,21,88,etc.) teach and render obvious the alternate use of containers (filled by picking means) placed on a

Serial No. 871832

-7-

Art Unit 317

conveyor. The use of conventional plural containers (as claimed) would have been obvious.

15. Claims 16-21 are rejected under 35 U.S.C. § 103 as being unpatentable over Morello et al in view of Buttarazzi as applied to claim 15 above, and further in view of O'Neil et al or Henderson.

Re claim 16, it would have been obvious to have included a machine readable label as taught by O'Neil et al or Henderson (34). The use of a conventional check station (re claims 20 and 21) operating as claimed would have been obvious.

16. Claim 36 is rejected under 35 U.S.C. § 103 as being unpatentable over Morello et al in view of Buttarazzi & O'Neil et al or Henderson as applied to claims 16-21 above, and further in view of the European Patent.

Note the obviousness discussion of the European Patent above. It would have been obvious to have conventionally accessed the rods in the claimed manner.

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to F.E. Werner whose telephone number is (703) 308-1140.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-1113.

Summary:

Serial No. 871832

-8-

Art Unit 317

Claims 1-23 and 36 are rejected

Claims 24-35 are withdrawn

Rejection-SSP 3 mos.

Werner/oc
October 08, 1993
October 12, 1993

Frank E. Werner
FRANK E. WERNER
PRIMARY EXAMINER 10/43
GROUP 3100

PTO FORM 948
(Rev. 8-01)U.S. DEPARTMENT OF COMMERCE
Patent and Trademark Office

ATTACHMENT TO PAPER NUMBER

5

APPLICATION NUMBER

821822

GROUP 3107

NOTICE OF DRAFTSMAN'S PATENT DRAWING REVIEW

The PTO Draftsman review all originally filed drawings regardless
of whether they were designated as informal or formal.The drawings filed 4/21/92A. ☐ are approved.B. ☒ are objected to under 37 CFR 1.84 for reason(s) checked below. The examiner will require submission of new, corrected drawings at the appropriate time. Corrected drawings must be submitted according to the instructions listed on the back of this Notice.

1. Paper and Ink. 37 CFR 1.84(a)

☐ Poor Quality Paper. Must be White.

Transparent Paper Not Allowed.

Sheet(s) _____

2. Size of Sheet and Margins. 37 CFR 1.84(b)

Acceptable Paper Sizes and Margins

Paper Size

Margin	8 1/2 by 14 inches	11 by 17 inches	DIN size A4 21 by 29.7 cm.
Top	2 inches	1 inch	2.5 cm.
Left	1/4 inch	1/4 inch	2.5 cm.
Right	1/4 inch	1/4 inch	1.5 cm.
Bottom	1/4 inch	1/4 inch	1.0 cm.

☐ Proper Size Paper Required. All
Sheets Must be Same Size.

Sheet(s) _____

☐ Proper Margins Required.

Sheet(s) _____

☐ Top ☐ Right
☐ Left ☐ Bottom

3. Character of Lines. 37 CFR 1.84(c)

☐ Lines Pale, Rough and Blurred, or
Jagged. Fig(s) _____☐ Solid Black Shading Not Allowed.

Fig(s) _____

4. ☐ Photographs Not Approved.☒ Comments:

- Remove box from around dws. Figs 8-10

5. Hatching and Shading. 37 CFR 1.84(d)

☐ Short Lines are Required.

Fig(s) _____

☐ Cross-Cross Hatching Not Allowed.

Fig(s) _____

☐ Double Line Hatching Not Allowed.

Fig(s) _____

☐ Parts in Section Must be Hatched
Properly. Fig(s) _____

6. Reference Characters. 37 CFR 1.84(f)

☐ Reference Characters Poor or Rough
and Blurred. Fig(s) _____☒ Minimum 1/8 inch (3.2 mm.) in height
is required. Fig(s) 8-10, 16-19☒ Figure Legends Poor or Placed outside of
Incorrectly. Fig(s) 19 dws.

7. Views. 37 CFR 1.84(g) & (j)

☐ Figures Must be Numbered Separately.☐ Figures Must Not be Connected
Fig(s) _____

8. Identification of Drawings. 37 CFR 1.84(i)

☐ Extraneous Matter or Copy Machine
Marks Not Allowed. Fig(s) _____9. ☐ Changes Not Completed from Prior
PTO-948 dated _____

Telephone inquiries concerning this review should be directed to the Chief Draftsman at telephone number (703) 557-6404.

Reviewing Draftsman_____
Date

PTO Copy

MA000197

TO SEPARATE, HIDE TOP AND BOTTOM EDGES, SNAP-APART AND DISCARD CARBON

FORM PTO-892 (REV. 2-92)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		SERIAL NO. 07/871832		GROUP/ART UNIT 3107		ATTACHMENT TO PAPER NUMBER 5				
NOTICE OF REFERENCES CITED				APPLICANT(S) Sean C. McDonald et al								
U.S. PATENT DOCUMENTS												
*	DOCUMENT NO.					DATE	NAME	CLASS	SUB-CLASS	FILING DATE IF APPROPRIATE		
A	4	8	9	6	024	1-1990	Morello et al	414	274Xr	10-19-87		
B	4	7	8	9	295	12-1988	Boucher, Jr. et al	414	280Xr			
C	5	1	2	9	777	7-1992	Pohjonen et al	414	280	12-24-90 6-30-97		
D	4	8	1	2	629	3-1989	O'Neil et al	414	274Xr	4-23-87 3-6-85		
E	4	5	4	6	901	10-1985	Buttarazzi	414	280Xr			
F	4	7	8	6	229	11-1988	Henderson	414	273Xr			
G	4	7	9	2	270	12-1988	Yoshida	414	273			
H	4	6	6	9	047	5-1987	Chuetz	414	331Xr			
I	4	8	2	0	109	4-1989	Witt	414	282	4-11-86		
J	4	6	5	1	863	3-1987	Reuter et al	414	280Xr			
K	3	8	0	2	580	4-1974	Castaldi	414	280Xr			
FOREIGN PATENT DOCUMENTS												
*	DOCUMENT NO.					DATE	COUNTRY	NAME	CLASS	SUB-CLASS	PERTINENT SHTS. DWG.	PP. SPEC.
L					304	1-1979	Pct	—	414	273		
M												
N												
O												
P												
Q												
OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)												
R												
S												
T												
U												
EXAMINER F.E. Lerner						DATE 9/93						
* A copy of this reference is not being furnished with this office action. (See Manual of Patent Examining Procedure, section 707.05 (a).)												

756-215

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT

In re application of: Sean McDonald et al.

Group No.: 3107

Serial No.: 07/871,832

Examiner: F. Werner

Filed: April 21, 1992

For: AN AUTOMATED SYSTEM FOR SELECTING PACKAGES FROM A STORAGE AREA

Commissioner of Patents and Trademarks
Washington, D.C. 20231

PETITION AND FEE FOR EXTENSION OF TIME (37 CFR 1.136(a))

1. This is a petition for an extension of time for a total period of one months:
(check and complete the applicable item below)

(x) to respond to the Office Letter mailed on 10/15/93
() for _____
(indicate matter being extended)

2. A response in connection with the matter for which this extension is requested:

(x) is filed herewith.
() has been filed.

3. Applicant is

(x) a small entity -- verified statement:
() attached.
(x) already filed.
() other than a small entity.

4. Calculation of extension fee

	Total months requested	Fee for other than small entity	Fee for small entity
(x)	one month	\$ 110.00	\$ 55.00
()	two months	\$ 360.00	\$ 180.00
()	three months	\$ 840.00	\$ 420.00
()	four months	\$1320.00	\$ 660.00

050 KS 02/20/94 07071832

1 215

\$ 55.00

050 KS 02/20/94 07071832

CERTIFICATE OF MAILING (37 CFR 1.8a)

1 215

\$0.00 CK

I hereby certify that this paper (along with any referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to the: Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Date: February 15, 1994

Angie F. Bayerl

Angie F. Bayerl
(Signature of person mailing paper)

(Petition and Fee for Extension of Time (37 CFR 1.136(a)) [11-2]-page 1 of 2)

(check and complete the next item, if applicable)

() An extension for _____ has already been secured and the fee paid
therefore of \$ _____ is deducted from the total fee due for the
total months of extension now requested.

Extension fee due with this request \$ _____

5. Fee Payment

(x) Attached is a check in the sum of \$ 55.00
() Charge fee to Account No. 02-4553 and for any additional extension
fee required or credit for any excess fee paid. A duplicate of this
petition is attached.

Reg. No.: 29,362

Tel. No.: 412-562-1632

FEE APPLIED under 37 CFR 1.136(a)
EXTENSION OF TIME GRANTED
TO 2-15-2008

[Signature]
CLERK, GROUP 310

[Signature]
Lynn J. Alstadt
Buchanan Ingersoll Professional Corporation
56th Floor, 600 Grant Street
Pittsburgh, Pennsylvania 15219

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit 3107 : PATENT APPLICATION
 Examiner F. Werner :
 In re application of : AN AUTOMATED SYSTEM
 SEAN McDONALD et al. : FOR SELECTING PACKAGES
 : FROM A STORAGE AREA
 Serial No. 07/871,832 :
 Filed April 21, 1992 :



8/a
3/7/94
at

RECEIVED
FEB 22 1994
GROUP 310

I hereby certify that this correspondence is being
 furnished with the United States Patent Service or that
 this is in an envelope addressed to: Commissioner
 of Patents and Trademarks, Washington, D.C. 20231,
 On 2-15-94

Angie Byers
 (Signature)

AMENDMENT

Pittsburgh, Pennsylvania 15219

February 15, 1994

Hon. Commissioner of Patents and Trademarks

Washington, D.C. 20231

Sir:

Please amend the claims as follows:

1. (Amended) A system for selecting and delivering
 packages from a [stored] storage area to fill orders comprising:
 - a) a storage area comprised of a plurality of storage
area locations each location [being] having package
holding means sized and configured to hold [at least
 one package] a plurality of individual packages each
individual package having a machine readable label
which identifies a type of package, the packages
being held in a manner so that [the] each package
 can be placed into and removed from the storage area

u

u

locations [by automated picking means], each location having a distinct x, y coordinate;

- b) automated picking means sized and configured to be able to hold packages, to select packages from the storage area locations and place packages in storage area locations in accordance with computer controlled instructions [received from a computer], the picking means having a gripper for grasping and moving individual packages;

- c) means for moving the automated picking means to selected storage locations;

[c)] d) a computer having at least one memory which contains a program for directing the picking means to chosen storage area locations and a database containing at least one x, y coordinate location in the storage area for each package held within the storage area the computer being connected to the automated picking means and the means for moving the automated picking means [,] and

- e) a package reader associated with the picking means and being positioned for reading the machine readable labels on packages located within the storage area.

wherein only one type of package is stored in each x, y coordinate location.

In claim 3, line 2, change "a package" to -- the package --.

A2 ~~7.~~ (Amended) The system of claim 1 wherein the picking means contains ^{the} ~~a~~ picking means storage area for holding ~~a~~ ^{the} plurality of packages selected by the picking means.

A3 ~~8.~~ (Amended) The system of claim 1 also comprising a supply station for receiving new and returned packages, the supply station having a plurality of locations each location [being] having package holding means sized and configured to hold at least one package in a manner so that the package can be placed into and removed from the locations by the automated picking means, each location having a distinct x, y coordinate.

~~9.~~ (Amended) The system of claim ~~1~~ ⁸ also comprising means for moving the supply station wherein the supply station is [movable and is sized to be] removably positioned adjacent the storage area.

~~10.~~ (Amended) The system of claim 1 wherein the package holding means in the storage area is comprised of a plurality of rods and a hole is provided in each package to permit the package to be held on the rods.

In claim 21, line 4, before "memory" insert -- the --.

Cancel claims 24-35

94 ~~20~~¹⁸ (Amended) A system as described in claim ~~20~~¹⁸ wherein the picking means includes at least one gripper that picks the packages; and a tooling support structure having at least one column to support the tooling and at least one row to support the column such that the tooling means moves along the column as the column moves along the row to pick a given package hanging from a corresponding support rod, said gripper able to turn at least 180° on the column to pick packages [on either the first or second holding means] from selected storage locations which locations are positioned opposite and facing one another; and means for moving the column with respect to the row, said moving means controlled by (a) the computer and in communication therewith.

REMARKS

This is in response to the Office Action dated October 15, 1993. Applicants are submitting herewith a request for a one month extension of time along with the appropriate fee.

In the Office Action the Examiner repeated his requirement for restriction. Applicants confirm the provisional election of claims 1 thru 23 and 36. Therefore, claims 24 thru 35 were cancelled. Applicants also confirm that cancellation of the non-elected claims does not require a change of inventorship of the elected claims.

The Section 112 Rejections

The Examiner rejected claims 1, 3, 9 and 21 under Section 112 because of a perceived double inclusion of structure. Although applicants disagree with this conclusion, they have nevertheless amended the cited portions of these claims so that they can no longer be read to provide such double inclusion.

Claim 36 was amended to cure the antecedent basis problem cited by the Examiner. This amended claim also more clearly recites the movement of the gripper and relative positions of the selected packages.

Claims 1 and 9 have been amended to state that the storage locations or supply station locations have package holding means. As disclosed in the specification, such structure could be shelves or rods. Indeed, amended claim 11 specifies that the package holding means are rods.

New element c) has been added to claim 1 to specify means for moving the automated picking means. This change is in response to the Examiner's suggestion that such means should be included.

Amended claim 1 also specifies that the packages have machine readable labels which identify the type of package. That label could give package contents, expiration dates or other information useful for grouping or distinguishing among packages in the system.

Finally, claim 10 was amended to include means for moving the supply station.

Applicants submit that these amendments overcome the section 112 rejections. Reconsideration of the claims as amended and withdrawal of the Section 112 rejections are respectfully requested.

The Section 113 Rejections

The pending claims have been rejected under Section 103 as obvious from United States Patent No. 4,896,024 to Morello et al. alone or in combination with patents to Boucher, Jr. et al. or Pohjonen et al. or O'Neil et al. or Buttarazzi or Henderson or the cited European application. Applicants have amended the pending claims to distinguish over these references. As amended, the claims now require that each storage location be capable of holding a plurality of packages, that each package have a machine readable label and that a package reader be associated with the picking means which reader is positioned for reading the machine readable labels on packages located within the storage area.

Morello et al. discloses an apparatus for dispensing and accepting the return of reusable articles such as videotapes. The reusable articles each have their own identification code, such as the 13 digit number illustrated in Figure 13. The apparatus has a housing containing a plurality of stationary locations each location being capable of holding a single reusable article therein and having its own location code. A computer and memory are provided for holding details of the location codes and article codes and controlling input and output

of information into and from the memory. A transfer assembly is utilized to remove individual articles from selected locations and return articles to selected locations. A central processing unit correlates the article identification code with the location code. As shown in Figures 3, 7, 8 and 9 and described at column 9, line 50 thru column 10, line 37, the system includes a picker assembly having a platen suitable for receiving the articles. The platen contains two generally parallel spaced apart plates mounted to a base plate. The plates define the location into which the selected article is positioned. A code sensor and reader is provided below the upper plate to read an article code on any article positioned above the base plate and between the two generally parallel plates. The teaching of Morello et al. is that the transfer assembly be sent to a specific location to select the desired article. The article is removed from the location into the picker assembly. There the identification code of the article is read. The picker assembly then delivers the article to a pick-up position. The picker assembly can also receive individual articles which have been placed at the gate mechanism 22. As disclosed, the picker assembly and the gate mechanism can handle only a single article at any given point in time. Similarly each storage location can accommodate a single article at any given point in time. This system relies upon the information in memory to direct the picker assembly to a selected location to find the desired article. When the picker assembly arrives at that location it cannot read the article

identification while the article remains in the storage location. This teaching is quite different from the system of amended claim 1. The claimed storage locations accommodate a plurality of packages and a package reader is positioned to read the package label while the package is in the storage location. Thus, this system does not rely solely upon the information in the computer memory to select articles from storage locations. Articles are removed from storage locations after the reader confirms that the desired article has been found. Consequently, the amount of false picks are substantially minimized. Furthermore, applicants' system is faster, since fewer wrong selections will be made. Both Morello's system and applicants' system can have memory errors or failures. Should there be an error in the memory or a crash, applicants' system can still operate using the package reader to locate desired packages. In contrast, should the Morello et al. system lose the stored information correlating package identification to individual locations, the system is inoperative until the memory has been totally reprogramed.

The Morello reference also does not teach or suggest the following elements of applicants' system: a vacuum head gripper (required by claim 2), a sensor attached to the picking means (claim 3), bar codes (claim 5), expiration dates on labels (claim 6), a storage area in the picking means for holding a plurality of packages (claim 7), storage rods for holding the packages (claims 8 and 11), a supply station which holds a plurality of packages (claim 9) and is movable (claim 10), a program for

checking compatibility of selected products (claim 13), a conveyor to carry selected packages (claim 14) or labeled containers holding selected packages (claims 16-19), a check station (claims 20 and 21) medicine packages (claim 22), or a track and column structure over which the picking means travels (claims 23 and 26). Consequently, the claims as amended are patentable over Morello.

O'Neil et al. teaches a method and apparatus for vending which has a plurality of storage positions that are accessed by a picking unit directed by a computer and microprocessor memory system. The picking unit travels over a horizontal bar which can move up and down on support posts. O'Neil teaches the use of mechanical fingers on a rotatable table device with a magnetic means for removing articles from the storage locations. Like Morello, O'Neil provides a package reader which can only read packages after they have been removed from the storage location. The picking unit may deliver the selected article to a removal location (Figure 1) or a conveyor (Figure 9). O'Neil also teaches that one article is positioned in each storage location (see Figure 1). Like Morello, the O'Neil device includes a return station 18. This station also accommodates only a single article at any given point in time. O'Neil does not teach or suggest the elements of applicants' claims 2, 3, 6, 7, 8, 9, 10, 11, 13 and 16 thru 23. Moreover, the bar and post arrangement used by O'Neil is significantly different from applicants' track and column system. Whereas, the O'Neil picking means can only

travel in a single plane, applicants' device can move in any x-y-z direction limited only by the track layout which can be any shape. O'Neil can only access one bank of storage locations whereas applicants' unit can access any number of banks of storage locations. Consequently, the O'Neil system is not suitable for many storage and access situations, such as a pharmacy, where hundreds or thousands of different packages are stored and selectively retrieved.

United States Patent No. 4,789,295 to Boucher et al. discloses an article manipulator for robots. That manipulator utilizes two vacuum cups for gripping articles. There is no disclosure of any type of storage locations beyond the positions of articles being held by the vacuum cups. Since it would be impractical to hold a separate article by each suction cup, this reference also teaches that only one article be held by the picking means at any point in time. Boucher's gripper does not include any type of package reader although it does utilize sensors for sensing the position of the article manipulator relative to an article (column 3, lines 3 thru 7). Boucher et al. also does not teach or suggest the elements of applicants' dependent claims 5 thru 23 and 36.

Pohjonen et al. also disclose a load handling method and system which utilizes a suction cup or an electromagnet for engaging articles. This patent teaches that articles are stored in boxes which are placed on and removed from a shelf. There is no teaching of the use of storage locations having x,y

coordinates which locations can receive a plurality of packages that can be separately selected. There is also no teaching of the elements required by claims 4 thru 13 and 15 thru 36.

United States Patent 4,546,901 to Buttarazzi discloses an apparatus for dispensing medication. The particular apparatus is essentially comprised of a plurality of pill dispensing units comprised of shelves containing bins of pills. The pills are individually blister packaged on a strip. The pill strips are withdrawn from the bins by a pair of gripping fingers supported on a carriage and placed on trays. A high speed conveyor transports the pills from the dispensing units to an inspection station. The carriage is mounted for transverse movement on a bar. The bar is attached transverse to a vertical column on which it moves up and down. This structure is very similar to that of O'Neil. Because the pill strips have been positioned in a precise predetermined location in the dispensing units, the dispensing carriage assemblies can be directed in advance to the locations of the desired medication. Like the other references, Buttarazzi does not teach storage locations which hold a plurality of individual packages each of which can be individually removed and replaced. Furthermore, no package reader is utilized by Buttarazzi which reader is positioned for reading machine readable labels on packages located within the storage locations. Buttarazzi also does not disclose a supply station for restocking the storage areas or the elements required by dependent claims 2 thru 14, 16 thru 23 and 36.

Henderson discloses a document storage retrieval system including a plurality of containers each having machine readable identifying indicia thereon. The disclosed containers are boxes of documents or ther articles. Each box is stored in a separate location "so that all of the articles or all articles or all of the documents are stored and retrieved as a unit." (Col. 4, lines 50-51). Thus, this system also does not permit storage of a plurality of packages in a single location such that individual packages may be retrieved and replaced. Like Morello and O'Neil each storage location contains only an individual container.


The cited European patent discloses a sorting machine wherein grippers support objects for attachment to a hook or a rail. This system does not rely upon a set of storage locations having distinct x,y coordinates. This reference was cited to show storage of packages on rods and removal of the packages from those rods. The storage system there disclosed is otherwise completely different from applicants' system.

Clearly none of the cited references disclose the claimed system. Taken together the cited prior art does not teach or suggest a system in which a plurality of individually retrievable packages are stored in a single location. The cited retrieval systems also do not have machines for reading machine readable labels on a package while that package is in a storage location. Consequently, amended claim 1 is patentable over the cited references. The remaining claims depend directly or indirectly from claim 1. Therefore, those claims are also

patentable over the cited references. Additionally, there is no teaching or suggestion of a picking means having a storage area which will hold a plurality of articles selected by the picking means as required by claim 7. The prior art also does not teach or suggest a movable supply station which holds a plurality of packages which can be removed by the picking means and placed in storage locations as set forth in claims 9 and 10. None of the prior art systems utilize a program for checking compatibility among products in packages selected by the picking means for a given order (claim 13). The art does not teach the tooling support structure of claim 36 which can pick packages from either a first or second holding means located opposite one another.

For the foregoing reasons, applicants submit that the claims as amended are patentable over the prior art. Reconsideration and allowance of the claims as amended are respectfully requested.

Respectfully submitted,
BUCHANAN INGERSOLL, P.C.

By 
Lynn J. Alstadt
Registration No. 29,362
Attorneys for Applicant

(412) 562-1632

FORM PTO-1083

C Docket No.: 920015

In re application of: Sean McDonald et alSerial No.: 07/871,832Filed: April 21, 1992For: AN AUTOMATED SYSTEM FOR SELECTING PACKAGES FROM A STORAGE AREATHE COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, DC 20231

Sir:

Transmitted herewith is an amendment in the above-identified application.

- ☒ Small entity status of this application under 37 CFR 1.9 and 1.27 has been established by a verified statement previously submitted.
- ☐ A verified statement to establish small entity status under 37 CFR 1.9 and 1.27 is enclosed.
- ☒ No additional fee is required.

The fee has been calculated as shown below:

	(Col. 1)		(Col. 2)		SMALL ENTITY			OTHER THAN A SMALL ENTITY	
	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NO. PREVIOUSLY PAID FOR	PRESENT EXTRA	ADDIT. RATE	ADDIT. FEE	OR	ADDIT. RATE	ADDIT. FEE
Total	24	MINUS	36	0	x 11 =	\$	OR	x 22 =	\$
Indep	2	MINUS	2	0	x 37 =	\$	OR	x 74 =	\$
FIRST PRESENTATION OF MULTIPLE DEP. CLAIM					+ 115 =	\$	OR	+ 230 =	\$
					TOTAL ADDIT. FEE	\$	OR	TOTAL	\$

- * If entry in Col. 1 is less than entry in Col. 2, write "0" in Col. 3.
- ** If the "Highest No. Previously Paid For" IN THIS SPACE is less than 20, write "20" in this space.
- *** If the "Highest No. Previously Paid For" IN THIS SPACE is less than 3, write "3" in this space.

- ☐ Please charge by Deposit Account No. 02-4553 the amount of \$ _____. A duplicate copy of this sheet is attached.
- ☐ A check in the amount of \$ _____ is attached.
- ☒ The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 02-4553. A duplicate copy of this sheet is attached.
- ☒ Any filing fees required under 37 CFR 1.16 for the presentation of extra claims.
- ☐ Any patent application processing fees under 37 CFR 1.17.

Respectfully submitted,

(412) 562- 1632

Lyman J. Witte
 Registration No. 29,362
 BUCHANAN INGERSOLL PROFESSIONAL CORPORATION
 600 Grant Street, 56th Floor
 Pittsburgh, PA 15219

MA000214



Dawn
UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
 Address: COMMISSIONER OF PATENTS AND TRADEMARKS
 Washington, D.C. 20231
Sn 07/871832

SERIAL NUMBER	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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EXAMINER

ART UNIT	PAPER NUMBER
----------	--------------

DATE MAILED:

This is a communication from the examiner in charge of your application.
 COMMISSIONER OF PATENTS AND TRADEMARKS

- ☐ This application has been examined ☒ Responsive to communication filed on Feb. 17, 1994 ☒ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), 30 days from the date of this letter.
 Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited by Examiner, PTO-892. | 2. <input type="checkbox"/> Notice re Patent Drawing, PTO-948. |
| 3. <input type="checkbox"/> Notice of Art Cited by Applicant, PTO-1449. | 4. <input type="checkbox"/> Notice of Informal Patent Application, Form PTO-152. |
| 5. <input type="checkbox"/> Information on How to Effect Drawing Changes, PTO-1474. | 6. <input type="checkbox"/> |

Part II SUMMARY OF ACTION

1. ☒ Claims 1-23 and 36 are pending in the application.
 Of the above, claims _____ are withdrawn from consideration.
2. ☒ Claims 24-35 have been cancelled.
3. ☐ Claims _____ are allowed.
4. ☒ Claims 1-23 and 36 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ Claims _____ are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable. ☐ not acceptable (see explanation or Notice re Patent Drawing, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____ has (have) been ☐ approved by the examiner. ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed on _____, has been ☐ approved. ☐ disapproved (see explanation).
12. ☐ Acknowledgment is made of the claim for priority under U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____; filed on _____.
13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

Serial No. 871832

-2-

Art Unit 317

-PART III-

1. Claims 1-23 and 36 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 1, "a storage area" (line 3), individual packages" (line 18) and "storage area locations" (line 15) are a double inclusion of structure. Re claim 4, this claim repeats all of the structure in base claim 1. Re claim 18, this claim repeats structure from claim 1, i.e. a package with a machine readable label.

2. The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered

Serial No. 871832

-3-

Art Unit 317

therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103.

4. Claims 1-7, 9, 10, 12-14, 22 and 23 are rejected under 35 U.S.C. § 103 as being unpatentable over Morello et al in view of Boucher et al and Chucta.

Morello et al disclose storage areas 40, automated picking means 20, 62, etc. on tracks 98 (99) and computer means 16 to assign the package to X-Y coordinates (column 11, lines 11-17) and to control the picking means, but do not disclose a gripper which is disclosed by Boucher et al (62,64) and in view of the same, it would have been obvious to have substituted a gripper as taught by Boucher et al as this would have been the substitution of equivalent handling means productive of no unexpected result. Morello et al do not disclose the article's bar code being read prior to transfer from the storage area which is disclosed by Chucta (194,188,118,etc.) and in view of the same, it would have been obvious to have read the ^{barcode} ~~code~~ prior to transfer to guarantee the correct article's selection prior to transfer as taught by Chucta. Re claim 2, Boucher, Jr. et al (62,64) disclose and render obvious the substitution of a vacuum head. Re claim 3, Boucher, Jr. et al (24,26) teach that it would have been obvious to have included a sensor for the package. Re claim 6, it would have been obvious to have included any relevant information on

Serial No. 871832

-4-

Art Unit 317

the label including an expiration date. Re claim 7, the inclusion of plural packages would have been obvious. Re claim 9, note supply station 22 of Morello et al. It would have been an obvious and conventional extension of Morello et al's matrix to have included a matrix supply station. Re claims 12 & 13, it would have been obvious to have programmed the computer in the claimed manner, if desired. Re claim 14, it would have been obvious to have included a conveyor to minimize manual intervention. Re claim 22, it would have been obvious to have handled medicine packages, if desired.

5. Claims 8 & 11 are rejected under 35 U.S.C. § 103 as being unpatentable over Morello et al in view of Boucher et al and Chucta as applied to claims 1 to 7, 9, 10, 12-14, 22 & 23 above, and further in view of the European Patent.

It would have been obvious to have substituted rods and holes in the package as taught by the European patent (1,15,etc.)

6. Claims 15 to 21 are rejected under 35 U.S.C § 103 as being unpatentable over Morello et al in view of Boucher et al and Chucta 12-14, 22 and 23 above, and further in view of Buttarazzi.

Buttarazzi (42, 21, 88, etc.) teaches and renders obvious the alternate use of containers (filled by picking means) placed on a conveyor. The use of conventional plural containers (as claimed) would have been obvious.

Re claim 16, it would have been obvious to have included a

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-5-

Art Unit 317

machine readable label as taught by Chucta (34). The use of a conventional check station (re claims 20 and 21) operating as claimed would have been obvious.

7. Claim 36 is rejected under 35 U.S.C. § 103 as being unpatentable over Morello et al in view of Boucher, Jr. et al, Chucta and as applied to claims 15-21 above, and further in view of the European Patent.

Note the obviousness discussion of the European Patent above. It would have been obvious to have conventionally accessed the rods in the claimed manner.

8. Applicant's arguments filed Feb. 17, 1994 have been fully considered but they are not deemed to be persuasive.

Re applicant's "Remarks" on the top of page 8, the same are not well-taken since the claimed subject matter, not the specification, is the measure of invention. Limitations in the specification cannot be read into the claims for the purpose of avoiding the prior art. In re Self, 213 USPQ 1,5 (CCPA 1982); In re Priest, 199 USPQ 11,15 (CCPA 1978). Re the "Remarks" on pages 10-12 concerning Boucher, Jr. et al, Buttarazzi and the European Patent, please note the application of the same in the above rejections.

9. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

Serial No. 871832

-6-

Art Unit 317

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.


10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to F.E. Werner whose telephone number is (703) 308-1140.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-1113.

Summary:

Claims 1-23 and 36 are rejected.

Final Rejection-SSP 3 mos.


FRANK E. WERNER
PRIMARY EXAMINER 5/94
GROUP 3100

Werner/oc
May 16, 1994



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKETT NO.
07/87832	04/21/92	San C. M & Donald et al	920015

EXAMINER

F. E. Werner

ART UNIT PAPER NUMBER

3107

10

DATE MAILED:

EXAMINER INTERVIEW SUMMARY RECORD

All participants (applicant, applicant's representative, PTO personnel):

- (1) Mr. Alstalt (3) _____
(2) Examiner Werner (4) _____

Date of Interview July 20, 1994

Type: ☐ Telephonic ☒ Personal (copy is given to ☐ applicant ☒ applicant's representative).

Exhibit shown or demonstration conducted: ☐ Yes ☒ No. If yes, brief description: _____

Agreement ☒ tentatively reached with respect to some or all of the claims in question. ☐ was not reached.

Claims discussed: at least claims 1, 4 and 18

Identification of prior art discussed: the art of record

Description of the general nature of what was agreed to if an agreement was reached, or any other comments: in a continuing application, it was suggested that claim 1 be further amended to include that in a back-to-back relationship after retrieval from the holding means, more than one package is suspended from the picking means, prior to delivery of the package.

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

- ☐ 1. It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph below has been checked to indicate to the contrary, A FORMAL WRITTEN RESPONSE TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW (e.g., items 1-7 on the reverse side of this form). If a response to the last Office action has already been filed, then applicant is given one month from this interview date to provide a statement of the substance of the interview.

- ☐ 2. Since the examiner's interview summary above (including any attachments) reflects a complete response to each of the objections, rejections and requirements that may be present in the last Office action, and since the claims are now allowable, this completed form is considered to fulfill the response requirements of the last Office action. Applicant is not relieved from providing a separate record of the substance of the interview unless box 1 above is also checked.

Examiner's Signature

FRANK E. WERNER

PRIMARY EXAMINER 7/20/94
GROUP 3100

PTOL-413 (REV. 2-93)

ORIGINAL FOR INSERTION IN RIGHT HAND FLAP OF FILE WRAPPER

MA000221


UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

 Address: COMMISSIONER OF PATENTS AND TRADEMARKS
 Washington, D.C. 20231

Sho 7/871832

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
07/871,832	04/21/92	MCDONALD	5 920015

 F1M1/1026
 LYNN J. ALSTADT
 BUCHANAN INGERSOLL PROFESSIONAL CORP.
 56TH FLOOR, 600 GRANT ST.
 PITTSBURGH, PA 15219

WERNER EXAMINER	
ART UNIT	PAPER NUMBER
3107	11

DATE MAILED:

10/26/94

NOTICE OF ABANDONMENT

This application is abandoned in view of:

1. ~~Applicant's failure to respond to the Office letter, mailed 02/25/92.~~
2. ☒ Applicant's letter of express abandonment which is in compliance with 37 C.F.R. 1.136.
3. ☐ Applicant's failure to timely file the response received _____ within the period set in the Office letter.
4. ☐ Applicant's failure to pay the required issue fee within the statutory period of 3 months from the mailing date of _____ of the Notice of Allowance.
 - ☐ The issue fee was received on _____.
 - ☐ The issue fee has not been received in Allowed Files Branch as of _____.

In accordance with 35 U.S.C. 151, and under the provisions of 37 C.F.R. 1.316(b), applicant(s) may petition the Commissioner to accept the delayed payment of the issue fee if the delay in payment was unavoidable. The petition must be accompanied by the issue fee, unless it has been previously submitted, in the amount specified by 37 C.F.R. 1.17 (f), and a verified showing as to the causes of the delay.

If applicant(s) never received the Notice of Allowance, a petition for a new Notice of Allowance and withdrawal of the holding of abandonment may be appropriate in view of *Delgar Inc. v. Schuyler*, 172 U.S.P.Q. 513.

5. ☐ Applicant's failure to timely correct the drawings and/or submit new or substitute formal drawings by _____ as required in the last Office action.
 - ☐ The corrected and/or substitute drawings were received on _____.
6. ☐ The reason(s) below.

** Expressly abandoned in favor of SN 08/295495 filed 8/25/94*

Frank E. Werner
 FRANK E. WERNER
 PRIMARY EXAMINER
 GROUP 3100

PATENT APPLICATION FEE DETERMINATION RECORD						Application or Docket Number	
Effective December 16, 1991						871842	
CLAIMS AS FILED - PART I						SMALL ENTITY OR OTHER THAN SMALL ENTITY	
(Column 1)		(Column 2)		(Column 3)		(Column 4)	
FOR	NUMBER FILED	NUMBER EXTRA		RATE	FEE	RATE	FEE
BASIC FEE					\$ 345.00		\$ 690.00
TOTAL CLAIMS	36	minus 20 =	16	x \$10 =	160	x \$20 =	
INDEPENDENT CLAIMS	2	minus 3 =		x 36 =		x 72 =	
MULTIPLE DEPENDENT CLAIM PRESENT				+ 110 =		+ 220 =	
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	505	TOTAL	
CLAIMS AS AMENDED - PART II						SMALL ENTITY OR OTHER THAN SMALL ENTITY	
(Column 1)		(Column 2)		(Column 3)		(Column 4)	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE
	Total	Minus	**	x \$10 =		x \$20 =	
	Independent	Minus	***	x 36 =		x 72 =	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM			+ 110 =		+ 220 =	
				TOTAL		TOTAL	
(Column 1)		(Column 2)		(Column 3)		(Column 4)	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE
	Total	Minus	**	x \$10 =		x \$20 =	
	Independent	Minus	***	x 36 =		x 72 =	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM			+ 110 =		+ 220 =	
				TOTAL		TOTAL	
(Column 1)		(Column 2)		(Column 3)		(Column 4)	
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE
	Total	Minus	**	x \$10 =		x \$20 =	
	Independent	Minus	***	x 36 =		x 72 =	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM			+ 110 =		+ 220 =	
				TOTAL		TOTAL	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
 ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
 *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
 The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.


Form PTO-875
(Rev. 12-91)

U.S. Government Printing Office: 1992 — 308-860

Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

MA000223

U.S. DEPARTMENT OF COMMERCE - PATENT & TRADEMARK OFFICE												1ST EXAMINER	DATE
PAGE DATA ENTRY CODING SHEET												2ND EXAMINER	DATE
APPLICATION NUMBER												GROUP	SHEETS OF
TYPE												ART UNIT	DRAWING
MONTH												CLASS	
DAY													
YEAR													
TOTAL CLAIMS												ATTORNEY DOCKET NUMBER	
INDEPENDENT CLAIMS													
SMALL ENTITY?													
FILING FEE													
FOREIGN LICENSE													
CONTINUITY DATA													
PARENT APPLICATION SERIAL NUMBER													
PARENT PATENT NUMBER													
PARENT FILING DATE													
MONTH													
DAY													
YEAR													
PCT/FOREIGN APPLICATION DATA													
PCT/FOREIGN APPLICATION SERIAL NUMBER													
FOREIGN FILING DATE													
MONTH													
DAY													
YEAR													
CONTINUITY CODE													
STATUS CODE													
PARENT APPLICATION SERIAL NUMBER													
PARENT PATENT NUMBER													
PARENT FILING DATE													
MONTH													
DAY													
YEAR													
FOREIGN PRIORITY CLAIMED													
COUNTRY CODE													
PCT/FOREIGN APPLICATION SERIAL NUMBER													
FOREIGN FILING DATE													
MONTH													
DAY													
YEAR													

BAR CODE LABEL							
		U.S. PATENT APPLICATION					
SERIAL NUMBER	FILING DATE	CLASS		GROUP ART UNIT			
08/295,495	08/25/94	414		3107			
APPLICANT	SEAN C. McDONALD, PITTSBURGH, PA; ELLEN J. HERTZ, CLEMMONS, NC; JAMES A. SMITH, ALLISON PARK, PA; GREGORY TOTO, SANTA CRUZ, CA.						
	CONTINUING DATA*** VERIFIED THIS APPLN IS A CON OF 07/871,832 04/21/92 WHICH IS A CIP OF 07/469,217 01/24/90 ABN						
	FOREIGN/PCT APPLICATIONS*** VERIFIED						
FOREIGN FILING LICENSE GRANTED 10/01/94				***** SMALL ENTITY *****			
STATE OR COUNTRY	SHEETS DRAWING	TOTAL CLAIMS	INDEPENDENT CLAIMS	FILING FEE RECEIVED	ATTORNEY DOCKET NO.		
PA	19	24	2	\$399.00	920015		
ADDRESS	LYNN J. ALSTADT BUCHANAN INGERSOLL 600 GRANT STREET, 56TH FLOOR PITTSBURGH, PA 15219						
TITLE	AUTOMATED SYSTEM FOR SELECTING PACKAGES FROM A STORAGE AREA						
This is to certify that annexed hereto is a true copy from the records of the United States Patent and Trademark Office of the application which is identified above. By authority of the COMMISSIONER OF PATENTS AND TRADEMARKS							
Date	Certifying Officer						



\$399.00 - 201-11/2wc
295495

DOCKET NUMBER 920015	ANTICIPATED CLASSIFICATION OF THIS APPLICATION CLASS SUBCLASS	PRIOR APPLICATION EXAMINER Frank E. Werner	APT UNIT 3107
-------------------------	--	--	------------------

Address to:

Commissioner of Patents and Trademarks
Box FWC
Washington, DC 20231

This is a Request for filing a ☐ continuation-in-part ☒ continuation ☐ divisional application under 37 CFR 1.62 of prior application Serial No 07/871,832 filed on April 21, 1992 entitled AN AUTOMATED SYSTEM FOR SELECTING by the following named inventor(s) / PACKAGES FROM A STORAGE AREA

FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
McDonald	1-00	Sean	C
RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
Pittsburgh	Pittsburgh	Pennsylvania	United States
POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
405 S. Braddock Ave	Pittsburgh	PA 15221, USA	
FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
Hertz	2-00	Ellen	J.
RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
Clemmons	Clemmons	North Carolina	United States
POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
4232 Lake Cliff Dr.	Clemmons	NC 27012, USA	
FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
Smith	3-00	James	A.
RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
Allison Park	Allison Park	Pennsylvania	United States
POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
3909 Ash Dr.	Allison Park	PA 15101, USA	

The above identified prior application in which no payment in the issue fee, abandonment of, or termination of proceedings has occurred, is hereby expressly abandoned as of the filing date of this new application. Please use all the contents of the prior application file wrapper, including the drawings, as the basic papers for the new application. (note: 37 CFR 1.60 may be used for applications where the prior application is not to be abandoned.)

1. ☐ Enter the amendment previously filed on _____ under 37 CFR 1.116 but unentered, in the prior application.
2. ☐ A preliminary amendment is enclosed.

The filing fee is calculated on the basis of the claims existing in the prior application as amended at 1 and 2 above

Claims	(1): For	(2): Number filed	(3): Number extra	(4): Rate	(5): Calculations
Total Claims		24 - 20 =	4	X \$ 22	201 \$88 15.00
Independent Claims		2 - 3 =	0	X \$ 74	
Multiple Dependent Claims: (if applicable)				+ \$ 230	
				Basic Fee	+ \$ 710
				Total of above Calculations =	\$ 798
				Reduction by 1.2 for filing by small entity (Note 37 CFR 1.9, 1.27, 1.28; if applicable, affidavit must be filed also)	\$ 399
				Total National Fee	\$399

3 ☐ The Commissioner is hereby authorized to charge fees under 37 CFR 1.16 and 1.17 which may be required, or credit any overpayment to Deposit Account No. 02-4553

4 ☒ A check in the amount of \$ 384.00 plus \$ 15.00 is enclosed.

5 ☐ A new oath or declaration is included since ☐ this application is a continuation-in-part which discloses and claims additional matter. ☐ correction of inventorship is being made.

6 ☒ Amend the specification by inserting before the first line the sentence:

B1 QD
This application is a ☐ continuation-in-part, ☒ continuation, ☐ division, of application Serial No. 07/871,832, filed April 21, 1992 *now abandoned which is a C-1-P of 6,002,463 which is a continuation-in-part of 6,002,463*

7 ☒ Small entity status is still proper in view of the verified statement filed in the parent application Serial No. 07/871,832 filed on April 21, 1992

8 ☐ Priority of application Serial No. filed on in is claimed under 35 U.S.C. 119.

9 ☒ The prior application is assigned of record to Automated Healthcare, Inc.,
261 Kappa Drive, Pittsburgh, Pennsylvania 15238

10 ☒ The power of attorney in the prior application is to: Lynn J. Alstadt, Esq.,
600 Grant Street, Pittsburgh, Pennsylvania 15219

11 ☒ Also enclosed is an Information Disclosure Statement

Address all future communications to: (May only be completed by applicant, or attorney or agent of record)

Lynn J. Alstadt, Esq.,

Buchanan Ingersoll, P.C.

600 Grant Street, 56th Floor
Pittsburgh, Pennsylvania 15219

It is understood that secrecy under 35 U.S.C. 122 is hereby waived to the extent that if information or access is available to any one of the applications in the file wrapper of a 37 CFR 1.82 application, be it either this application or a prior application in the same file wrapper, the Patent and Trademark Office may provide similar information or access to all the other applications in the same file wrapper.

August 25, 1994

Date

Lynn J. Alstadt
Signature

- ☐ inventor(s)
☐ assignee of complete interest
☒ attorney or agent of record
☐ filed under §1.34(a)

FULL NAME OF INVENTOR	FAMILY NAME <u>Toto</u> <i>4-00</i>	FIRST GIVEN NAME <u>Gregory</u>	SECOND GIVEN NAME
RESIDENCE & CITIZENSHIP	CITY <u>Santa Cruz</u>	STATE OR FOREIGN COUNTRY <u>California</u> <i>Ca</i>	COUNTRY OF CITIZENSHIP <u>United</u>
POST OFFICE ADDRESS	POST OFFICE ADDRESS <u>815B Corcoran Ave.</u>	CITY <u>Stata Cruz</u>	STATE & ZIP CODE/COUNTRY <u>CA 95062, USA</u>
FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY

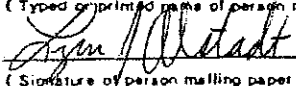
CERTIFICATE OF MAILING BY "EXPRESS MAIL" UNDER 37 CFR 1.10 - SEPARATE PAPER -		ATTORNEY'S DOCKET NO. 920015
IN RE APPLICATION OF <u>Sean C. McDonald et al</u>		FILED
SERIAL NUMBER		FOR AN AUTOMATED SYSTEM FOR SELECTING PACKAGES FROM A STORAGE AREA
GRP. ART UNIT 3107	EXAMINER Frank E. Werner	

"Express Mail" mailing label number B 188 307 92Y

Date of deposit August 25, 1994

I hereby certify that this paper or fee is being deposited with
 the United States Postal Service "Express Mail Post Office to
 Addressee" service under 37 CFR 1.10 on the date indicated above
 and is addressed to the Commissioner of Patents and Trademarks,
 Washington, D.C. 20231.

Lynn J. Alstadt
 (Typed or printed name of person mailing paper or fee)


 (Signature of person mailing paper or fee)

Form PTO-FB-A640 (6-83)

Patent and Trademark Office - U.S. DEPT. of COMMERCE

MA000229

08 295495



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit 3107

Examiner Frank E. Werner

In re application of

SEAN McDONALD et al.

:
: AN AUTOMATED SYSTEM
: FOR SELECTING PACKAGES
: FROM A STORAGE AREA
:

INFORMATION DISCLOSURE STATEMENT

Pittsburgh, Pennsylvania 15219

August 25, 1994

Hon. Commissioner of Patents and Trademarks

Washington, D.C. 20231

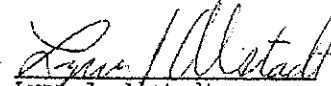
Sir:

The most pertinent prior art known to applicants has been cited in the parent application Serial No. 07/871,832, filed April 21, 1992. Form PTO 1449 listing that prior art is attached hereto. Pursuant to 37 C.F.R. 1.98(d) no copy of these references are submitted herewith.

Respectfully submitted,

BUCHANAN INGERSOLL, P.C.

By


Lynn J. Aistadt
Registration No. 29,362

Attorneys for Applicants

(412) 562-1632

MA000230

SHEET 1 OF 1

FORM PTO-1449 (Rev. 7-80)		U.S. Department of Commerce Patent and Trademark Office		ATTY. DOCKET NO. 920015	SERIAL NO.
LIST OF PRIOR ART CITED BY APPLICANT (Use several sheets if necessary)				APPLICANT Sean McDonald et al.	
				FILED DATE	GROUP

U.S. PATENT DOCUMENTS						
*EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	IF APPROPRIATE
	AA	3,986,612	10/76	Kamm et al.	209	111.7
	AB	4,687,390	7/87	Bonneton et al.	414	282
	AC					
	AD					
	AE					
	AF					
	AG					
	AH					
	AI					
	AJ					
	AK					

FOREIGN PATENT DOCUMENTS							
DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION		
					YES	NO	
AL	2 596 299	10/87	French				
AM	FR85/00232	8/84	PCT				

OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)		
AR		
AS		
AT		

EXAMINER	DATE CONSIDERED
----------	-----------------

* EXAMINER: Initial if reference considered; whether or not citation is in conformance with PEP 809. Draw line through question if not in conformance and not considered. Include copy of this form with next communication to applicant.



**UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
---------------	-------------	----------------------	---------------------

08/295,495 08/25/94 McDONALD

EXAMINER 328015

WERNER, F

F1M1/1104

ART UNIT PAPER NUMBER

LYNN J. ALSTADT
BUCHANAN INGERSOLL
600 GRANT STREET, 56TH FLOOR
PITTSBURGH, PA 15219

DATE MAILED: 3107

11/04/94

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☒ ~~Response to communication filed on Feb. 17, 1994~~ ☒ Response to communication filed on Feb. 17, 1994 ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), 3 days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited by Examiner, PTO-892. | 2. <input type="checkbox"/> Notice re Patent Drawing, PTO-948. |
| 3. <input type="checkbox"/> Notice of Art Cited by Applicant, PTO-1449. | 4. <input type="checkbox"/> Notice of Informal Patent Application, Form PTO-152. |
| 5. <input type="checkbox"/> Information on How to Effect Drawing Changes, PTO-1474. | 6. <input type="checkbox"/> |

Part II SUMMARY OF ACTION

1. ☒ Claims 1-23 and 36 are pending in the application.
Of the above, claims _____ are withdrawn from consideration.
2. ☒ Claims 24-35 have been cancelled.
3. ☐ Claims _____ are allowed.
4. ☒ Claims 1-23 and 36 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ Claims _____ are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable. ☐ not acceptable (see explanation or Notice re Patent Drawing, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____, has (have) been ☐ approved by the examiner. ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed on _____, has been ☐ approved. ☐ disapproved (see explanation).
12. ☐ Acknowledgment is made of the claim for priority under U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____; filed on _____.
13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to this merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☒ Other The preamendment of Aug. 25, 1994 has been entered.

EXAMINER'S ACTION

PTOL-326 (Rev. 9-89)

MA000232

Serial No. 295495

-2-

Art Unit 317

1. Claims 1-23 and 36 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 1, "a storage area" (line 3), individual packages" (line 18) and "storage area locations" (line 15) are a double inclusion of structure. Re claim 4, this claim repeats all of the structure in base claim 1. Re claim 18, this claim repeats structure from claim 1, i.e. a package with a machine readable label.

2. The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out

Serial No. 295495

-3-

Art Unit 317

the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103.

4. Claims 1-7, 9, 10, 12-14, 22 and 23 are rejected under 35 U.S.C. § 103 as being unpatentable over Morello et al in view of Boucher et al and Chucta.

Morello et al disclose storage areas 40, automated picking means 20, 62, etc. on tracks 98 (99) and computer means 16 to assign the package to X-Y coordinates (column 11, lines 11-17) and to control the picking means, but do not disclose a gripper which is disclosed by Boucher, Jr. et al (62,64) and in view of the same, it would have been obvious to have substituted a gripper as taught by Boucher, Jr. et al as this would have been the substitution of equivalent handling means productive of no unexpected result. Morello et al do not disclose the article's bar code being read prior to transfer from the storage area which is disclosed by Chucta (194,188,118,etc.) and in view of the same, it would have been obvious to have read the bar code prior to transfer to guarantee the correct article's selection prior to transfer as taught by Chucta. Re claim 2, Boucher Jr. et al (62,64) disclose and render obvious the substitution of a vacuum head. Re claim 3, Boucher, Jr. et al (24,26) teach that it would have been obvious to have included a sensor for the package. Re claim 6, it would have been obvious to have included any relevant information on the label including an expiration date. Re claim

Serial No. 295495

-4-

Art Unit 317

7, the inclusion of plural packages would have been obvious. Re claim 9, note supply station 22 of Morello et al. It would have been an obvious and conventional extension of Morello et al's matrix to have included a matrix supply station. Re claims 12 & 13, it would have been obvious to have programmed the computer in the claimed manner, if desired. Re claim 14, it would have been obvious to have included a conveyor to minimize manual intervention. Re claim 22, it would have been obvious to have handled medicine packages, if desired.

5. Claims 8 and 11 are rejected under 35 U.S.C. § 103 as being unpatentable over Morello et al in view of Boucher and Chucta et al as applied to claims 1-7, 9, 10, 12-14, 22 and 23 above, and further in view of the European Patent.

It would have been obvious to have substituted rods and holes in the package as taught by the European patent (1,15,etc.).

6. Claims 15-21 are rejected under 35 U.S.C. § 103 as being unpatentable over Morello et al in view of Boucher, Jr. et al and Chucta as applied to claims 1-7, 9, 10, 12-14, 22 and 23 above, and further in view of Buttarazzi.

Buttarazzi (42, 21, 88, etc.) teaches and renders obvious the alternate use of containers (filled by picking means) placed on a conveyor. The use of conventional plural containers (as claimed) would have been obvious.

Serial No. 295495

-5-

Art Unit 317

Re claim 16, it would have been obvious to have included a machine readable label as taught by Chucta (34). The use of a conventional check station (re claims 20 and 21) operating as claimed would have been obvious.

7. Claim 36 is rejected under 35 U.S.C. § 103 as being unpatentable over Morello et al in view of Boucher, Jr. et al and Buttarazzi as applied to claims 15-21 above, and further in view of the European Patent.

Note the obviousness discussion of the European Patent above. It would have been obvious to have conventionally accessed the rods in the claimed manner.

8. Applicant's arguments filed Feb. 17, 1994 have been fully considered but they are not deemed to be persuasive.

Re applicant's "Remarks" on the top of page 8, the same are not well-taken since the claimed subject matter, not the specification, is the measure of invention. Limitations in the specification cannot be read into the claims for the purpose of avoiding the prior art. In re Self, 28 USPQ 1,5 (CCPA 1982); In re Priest, 199 USPQ 11,15 (CCPA 1978). Re the "Remarks" on pages 10-12 concerning Boucher, Jr. et al, Buttarazzi and the European Patent, please note the application of the same in the above rejections.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to F.E. Werner whose telephone number is (703) 308-1140.

Serial No. 295495

-6-

Art Unit 317

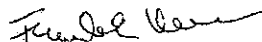
Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-1113.

Summary:

Claims 1-23 and 36 are rejected.

Rejection-SSP 3 mos.

Werner/oc
November 03, 1994


FRANKE WERNER
PRIMARY EXAMINER 11/94
GROUP 3100



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

RECEIVED
FEB 13 1995

14/C etc
9/13/95
3/6/95
GROUP 310

Group Art Unit 3107 : PATENT APPLICATION
Examiner F. Werner :
In re application of : AN AUTOMATED SYSTEM
SEAN McDONALD et al. : FOR SELECTING PACKAGES
Serial No. 08/295,495 : FROM A STORAGE AREA
Filed August 25, 1994 :

I hereby certify that this correspondence is being deposited with the United States Patent and Trademark Office as first class mail in an envelope addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

AMENDMENT

February 6, 1995
Sean McDonald

Pittsburgh, Pennsylvania 15219

February 6, 1995

Hon. Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

Please amend the claims as follows:

1. (Amended) A system for selecting and delivering packages [from a storage area] to fill orders comprising:
 - a) a storage area comprised of a plurality of storage area locations each location having package holding means sized and configured to hold a plurality of individual packages each individual package having a machine readable label which identifies a type of package, the packages being held in a manner so that each package can be placed into and removed from the storage area locations and so that the machine

39

readable label on at least one package in a storage location can be read without removing the package from the storage location, each location having a distinct x, y coordinate;

- 9
- b) automated picking means sized and configured to be able to hold packages, to select packages from the storage area locations and place packages in the storage area locations in accordance with computer controlled instructions, the picking means having a gripper for grasping and moving [individual] the packages and having a picking means storage location sized and configured to hold a plurality of packages in a face to face relationship after the plurality of packages have been retrieved from the storage area and prior to delivery of the plurality of packages to a desired destination separate from the picking means;
 - c) means for moving the automated picking means to selected storage locations;
 - d) a computer having at least one memory which contains a program for directing the picking means to chosen storage area locations and a database containing at least one x, y coordinate location in the storage area for each package held within the storage area the computer being connected to the automated picking means and the means for moving the automated picking means; and

9
e) a package reader associated with the picking means and being positioned for reading the machine readable labels on packages located within the storage area, wherein only one type of package is stored in each x, y coordinate location.

Cancel claims 4 and 18.

REMARKS

This is in response to the Office Action dated November 4, 1994.

The Section 112 Rejections

The Examiner rejected all pending claims under Section 112 because of a perceived double inclusion of structure. Claim 1 has been amended and claims 4 and 18 were cancelled to overcome the problem. Reconsideration of the claims as amended and withdrawal of the Section 112 rejections are, therefore, respectfully requested.

The Section 103 Rejections

The pending claims have been rejected under Section 103 as obvious from United States Patent No. 4,896,024 to Morello et al. in combination with patents to Boucher, Jr. et al. or Chucta or Buttarazzi or the cited European application. Applicants have amended claim 1 to require that the picking means have a picking means storage location capable of holding a plurality of packages

after those packages have been retrieved from the storage area and prior to delivery to a location separate from the picking means. This change is consistent with the suggestion made by the Examiner in an interview dated July 20, 1994, in the parent application.

Morello et al. discloses an apparatus for dispensing and accepting the return of reusable articles such as videotapes. The apparatus has a housing containing a plurality of stationary locations each location being capable of holding a single reusable article therein and having its own location code. A transfer assembly is utilized to remove individual articles from selected locations and return articles to selected locations. As shown in Figures 3, 7, 8 and 9 and described at column 9, line 50 thru column 10, line 37, the Morello system includes a picker assembly having a platen suitable for receiving a selected article. The platen contains two generally parallel spaced apart plates mounted to a base plate. The plates define the location into which the selected article is positioned. The teaching of Morello et al. is that the transfer assembly be sent to a specific location to select one desired article stored in that location. The article is removed from the location into the picker assembly. There the identification code of the article is read. The picker assembly then delivers the article to a pick-up position. The picker assembly can also receive individual articles which have been placed at the gate mechanism 22. As disclosed, the picker assembly and the gate mechanism can handle only a single article at any given point in time. Similarly each storage location can

accommodate a single article at any given point in time. This system relies upon the information in memory to direct the picker assembly to a selected location to find the desired article. When the picker assembly arrives at that location it cannot read the article identification while the article remains in the storage location. This teaching is quite different from the system of amended claim 1. Both the claimed storage locations and the picking means can accommodate a plurality of packages. A package reader is positioned to read the package label while the package is in the storage location. Thus, this system does not rely solely upon the information in the computer memory to select articles from storage locations. Articles are removed from storage locations after the reader confirms that the desired article has been found. Consequently, the amount of false picks are substantially minimized. Furthermore, applicants' system is faster, since fewer wrong selections will be made. Both Morello's system and applicants' system can have memory errors or failures. Should there be an error in the memory or a crash, applicants' system can still operate using the package reader to locate desired packages. In contrast, should the Morello et al. system lose the stored information correlating package identification to individual locations, the system is inoperative until the memory has been totally reprogrammed.

The Morello reference also does not teach or suggest the following elements of applicants' system: a vacuum head gripper (required by claim 2), a sensor attached to the picking means

(claim 3), bar codes (claim 5), expiration dates on labels (claim 6), a storage area in the picking means for holding a plurality of packages (claim 7), storage rods for holding the packages (claims 8 and 11), a supply station which holds a plurality of packages (claim 9) and is movable (claim 10), a program for checking compatibility of selected products (claim 13), a conveyor to carry selected packages (claim 14) or labeled containers holding selected packages (claims 16-19), a check station (claims 20 and 21) medicine packages (claim 22), or a track and column structure over which the picking means travels (claims 23 and 26). Consequently, the claims as amended are patentable over Morello.

Chutca discloses an automated parts supply system in which a computer controlled guided vehicle carries one or more modules holding several trays. Each tray contains several parts. Each module and each tray has a machine readable label. The vehicle is operated by a computer to deliver trays of parts to work stations. A transfer mechanism is provided to remove trays from the module and replace those trays into the module. Thus, this system moves and tracks only trays of parts, not individual parts. Neither the parts nor the trays are stored on the vehicle in a face-to-face relationship. Additionally, only a single container is held at each storage location within the system. In contrast, the system of claim 1 contains storage locations in which a plurality of machine readable labeled packages are kept. Additionally, the selected package of applicants' system are then held in a face-to-face relationship on the picking means. Thus, Chutca in

combination with Morello does not teach or suggest the system of claim 1 as here amended.

United States Patent No. 4,789,295 to Boucher et al. discloses an article manipulator for robots. That manipulator utilizes two vacuum cups for gripping articles. There is no disclosure of any type of storage location beyond the positions of articles being held by the vacuum cups. Since it would be impractical to hold a separate article by each suction cup, this reference also teaches that only one article be held by the picking means at any point in time. Boucher's gripper does not include any type of package reader although it does utilize sensors for sensing the position of the article manipulator relative to an article (column 3, lines 3 thru 7). Boucher et al. also does not teach or suggest the elements of applicants' dependent claims 5 thru 23 and 36.

United States Patent 4,546,901 to Buttarazzi discloses an apparatus for dispensing medication. The particular apparatus is essentially comprised of a plurality of pill dispensing units comprised of shelves containing bins of pills. The pills are individually blister packaged on a strip. The pill strips are withdrawn from the bins by a pair of gripping fingers supported on a carriage and placed on trays. A high speed conveyor transports the pills from the dispensing units to an inspection station. The carriage is mounted for transverse movement on a bar. The bar is attached transverse to a vertical column on which it moves up and down. Because the pill strips have been positioned in a precise

predetermined location in the dispensing units, the dispensing carriage assemblies can be directed in advance to the locations of the desired medication. Like the other references, Buttarazzi does not teach storage locations which hold a plurality of individual packages each of which can be individually removed and replaced. Furthermore, no package reader is utilized by Buttarazzi which reader is positioned for reading machine readable labels on packages located within the storage locations. Buttarazzi also does not disclose a supply station for restocking the storage areas or the elements required by dependent claims 2, 3, 5 thru 14, 16, 17, 19 thru 23 and 36.


The cited European patent discloses a sorting machine wherein grippers support objects for attachment to a hook or a rail. This system does not rely upon a set of storage locations having distinct x,y coordinates. This reference was cited to show storage of packages on rods and removal of the packages from those rods. The storage system there disclosed is otherwise completely different from applicants' system.

Clearly, none of the cited references disclose the claimed system. Taken together the cited prior art does not teach or suggest a system in which a plurality of individually retrievable packages can be stored in a single storage location and in a single picking means storage location. Consequently, amended claim 1 is patentable over the cited references. The remaining claims depend directly or indirectly from claim 1. Therefore, those claims are also patentable over the cited references. The prior art also does

not teach or suggest a movable supply station which holds a plurality of packages which can be removed by the picking means and placed in storage locations as set forth in claims 9 and 10. None of the prior art systems utilize a program for checking compatibility among products in packages selected by the picking means for a given order (claim 13). The art does not teach the tooling support structure of claim 36 which can pick packages from either a first or second holding means located opposite one another.

For the foregoing reasons, applicants submit that the claims as amended are patentable over the prior art. Reconsideration and allowance of the claims as amended are respectfully requested.

Respectfully submitted,
BUCHANAN INGERSOLL, P.C.

By 
Lynn J. Alstadt
Registration No. 29,362

Attorneys for Applicant

(412) 562-1632



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
---------------	-------------	-----------------------	---------------------

08/295,495 08/25/94 McDONALD

6 920015

EXAMINER

WERNER, F

F1M1/0307

LYNN J. ALSTADT
BUCHANAN INGERSOLL
600 GRANT STREET, 56TH FLOOR
PITTSBURGH, PA 15219

ART UNIT

PAPER NUMBER

15

DATE MAILED: 07

EXAMINER INTERVIEW SUMMARY RECORD

03/07/95

All participants (applicant, applicant's representative, PTO personnel):

(1) Mr. Alstadt (3) _____
(2) Exmr. Werner (4) _____

Date of interview 3/3/95

Type: ☒ Telephonic ☐ Personal (copy is given to ☐ applicant ☒ applicant's representative).

Exhibit shown or demonstration conducted: ☐ Yes ☒ No. If yes, brief description: _____

Agreement ☒ was reached with respect to some or all of the claims in question. ☐ was not reached.

Claims discussed: 5, 6, 19 and 20

Identification of prior art discussed: _____

Description of the general nature of what was agreed to if an agreement was reached, or any other comments: it was agreed that claims 5 and 6 be made dependent on claim 1 and that claims 19 and 20 be made dependent on claim 15 and this has been done by the Examiner

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

☒ 1. It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph below has been checked to indicate to the contrary, A FORMAL WRITTEN RESPONSE TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW (e.g., items 1-7 on the reverse side of this form). If a response to the last Office action has already been filed, then applicant is given one month from this interview date to provide a statement of the substance of the interview.

☒ 2. Since the examiner's interview summary above (including any attachments) reflects a complete response to each of the objections, rejections and requirements that may be present in the last Office action, and since the claims are now allowable, this completed form is considered to fulfill the response requirements of the last Office action. Applicant is not relieved from providing a separate record of the substance of the interview unless box 1 above is also checked.

PTOL-413 (REV. 2-93)

ORIGINAL FOR INSERTION IN RIGHT HAND FLAP OF FILE WRAPPER

Examiner's Signature

FRANK E. WERNER

PRIMARY EXAMINER 3/3/95
GROUP 3100

MA000247



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: Box ISSUE FEE
COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

F1M1/0007

LYNN J. ALSTADT
BUNNAN INGEROLL
600 GRANT STREET, 56TH FLOOR
PITTSBURGH, PA 15219

**NOTICE OF ALLOWANCE
AND ISSUE FEE DUE**

- ☐ Note attached communication from the Examiner
☐ This notice is issued in view of applicant's communication filed _____

SERIES CODE/SERIAL NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
08/275,495	08/25/94	022	WERNER, F	5107 03/07/95
First Named Applicant	HEDDOLLO, SEAN D.			

TITLE OF INVENTION AUTOMATED SYSTEM FOR SELECTING PACKAGES FROM A STORAGE AREA

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPL. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
3 920015	414-273.000	050	UTILITY	YES	\$605.00	06/07/95

THE APPLICATION IDENTIFIES ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED.

THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.

HOW TO RESPOND TO THIS NOTICE:

- I. Review the SMALL ENTITY Status shown above.
If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

- A. If the status is changed, pay twice the amount of the FEE DUE shown above and notify the patent and Trademark Office of the change in status, or
B. If the Status is the same, pay the FEE DUE shown above.

If the SMALL ENTITY is shown as NO:

- A. Pay FEE DUE shown above, or
B. File verified statement of Small Entity Status before, or with, pay of 1/2 the FEE DUE shown above.

- II. Part B of this notice should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by charge to deposit account, Part B should be completed and returned. If you are charging the ISSUE FEE to your deposit account, Part C of this notice should also be completed and returned.
III. All communications regarding this application must give series code (or filing date), serial number and batch number. Please direct all communication prior to issuance to Box ISSUE FEE unless advised to contrary.

IMPORTANT REMINDER: Patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

416



310 #18

SEP -1 1995
CHIEF

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit 3107 : PATENT
Examiner F. Werner :
In re application of :
SEAN MCDONALD ET AL. : AUTOMATED SYSTEM FOR
Serial No. 08/295,495 : SELECTING PACKAGES FROM
Filed August 25, 1994 : A STORAGE AREA
Allowed March 7, 1995 :

4100

LETTER

Pittsburgh, Pennsylvania 15219

August 21, 1995

Hon. Commissioner of Patents and Trademarks

Washington, D. C. 20231

Attention: Brenda Moore - Drawing Processing Branch

Sir:

This is in response to the Notice of Outstanding Drawing Requirement of August 16, 1995 indicating that the requirement for formal drawings (Form PTOL-37) attached to the official Notice of Allowance of March 7, 1995 has not been satisfied.

We are enclosing herewith a copy of our letter of April 25, 1995 enclosing seven (7) sheets of formal drawings and

The undersigned hereby certifies that the enclosed is being delivered to the Patent and Trademark Office as first class mail, and that the enclosed is being delivered to the Patent and Trademark Office as first class mail, and that the enclosed is being delivered to the Patent and Trademark Office as first class mail.

[Signature]

a copy of the postcard received and stamped by the Mail Room on April 27, 1995.

In view of the fact that the drawings were obviously misplaced or lost by the Patent and Trademark Office, we are enclosing herewith the seven (7) sheets of formal drawings containing Figures 8 thru 10 and 16 thru 19 for entry into the above-entitled application.

Please substitute these drawings for the drawings originally filed with the application. A copy of the Notice of Draftsperson's Patent Drawing Review (Form 948) is also enclosed which objects to the original drawings filed with the application. These drawings overcome the objections.

Entry of the formal drawings is respectfully requested.

Respectfully submitted,



Lynn J. Alstadt
Registration No. 29,362
BUCHANAN INGERSOLL, P.C.
600 Grant Street, 56th Floor
Pittsburgh, PA 15219
(412) 562-1632

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit 3107 : PATENT
Examiner F. Werner :
In re application of : AUTOMATED SYSTEM FOR
SEAN MCDONALD et al. : SELECTING PACKAGES FROM
A STORAGE AREA
Serial No. 08/295,495 :
Filed August 25, 1994 :
Allowed March 7, 1995 :

LETTER

Pittsburgh, Pennsylvania 15219

April 25, 1995

Hon. Commissioner of Patents and Trademarks

Washington, D.C. 20231

Sir:

Enclosed herewith are seven sheets of formal drawings containing Figures 8 thru 10 and 16 thru 19 for entry into the above-titled application. Please substitute these drawings for the drawings originally filed with the application. A copy of the Notice of Draftperson's Patent Drawing Review (Form 948) is also enclosed which objects to the original drawings filed with the application. These drawings overcome the objections.

I hereby certify that this correspondence is being
sent by first class mail, return receipt requested,
to the addressee named above.
Sincerely,
F. Werner

April 25, 1995
F. Werner

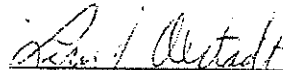
MA000252

Entry of the formal drawings is respectfully requested.

Respectfully submitted,

BUCHANAN INGERSOLL, P.C.

By


Lynn J. Alstadt

Registration No. 29,362

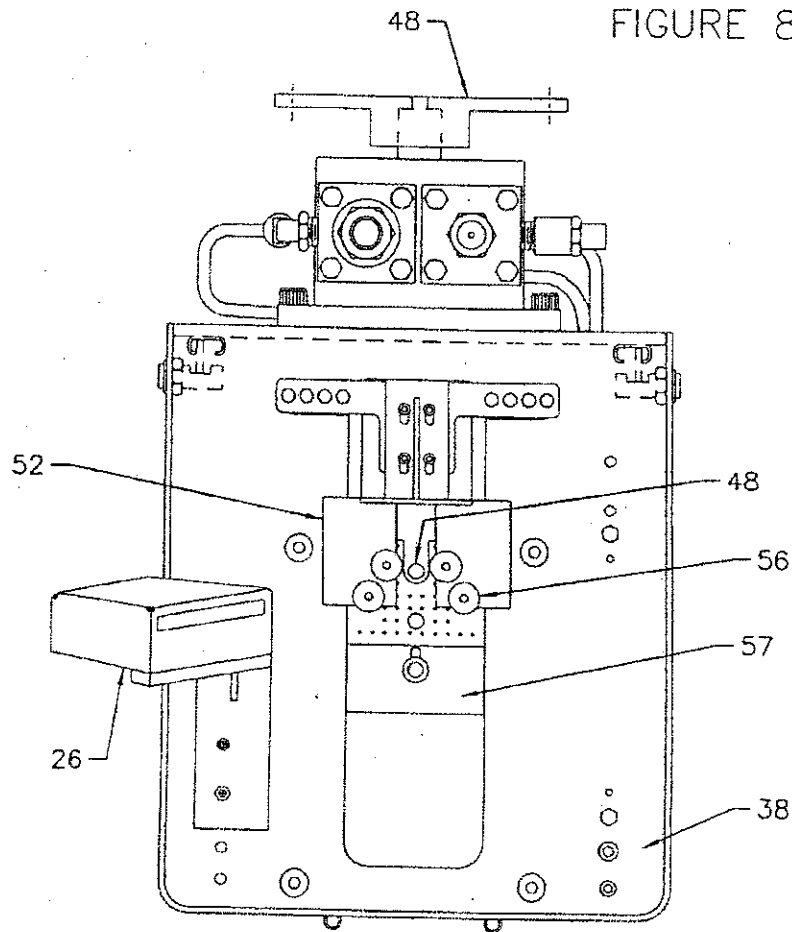
Attorneys for Applicants

(412) 562-1632

APPROVED	D.G. FIG.	
BY	CLASS	SUBCLASS
DRAPFISHAN		

895495

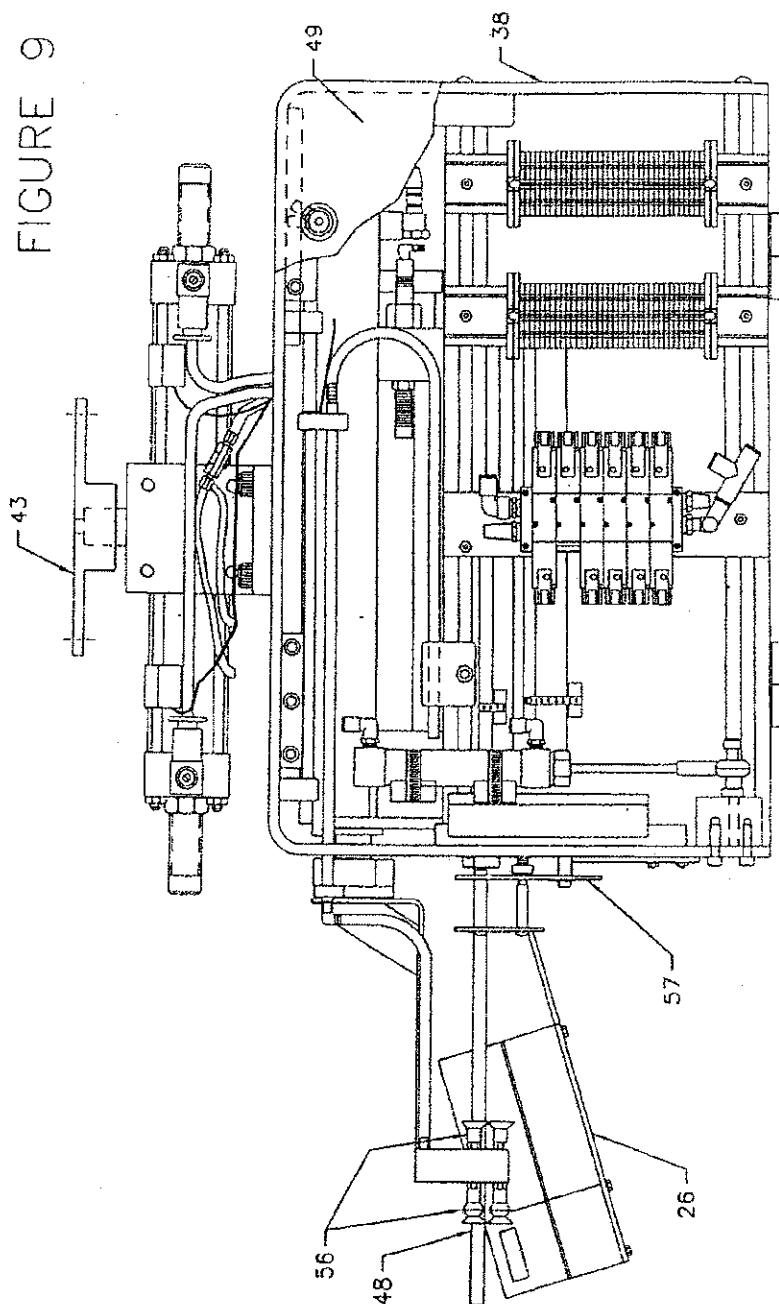
FIGURE 8



APPROVED	O.C. FIG.	
BY	CLASS	SUBCLASS
(WIAF) (SHAH)		

295495

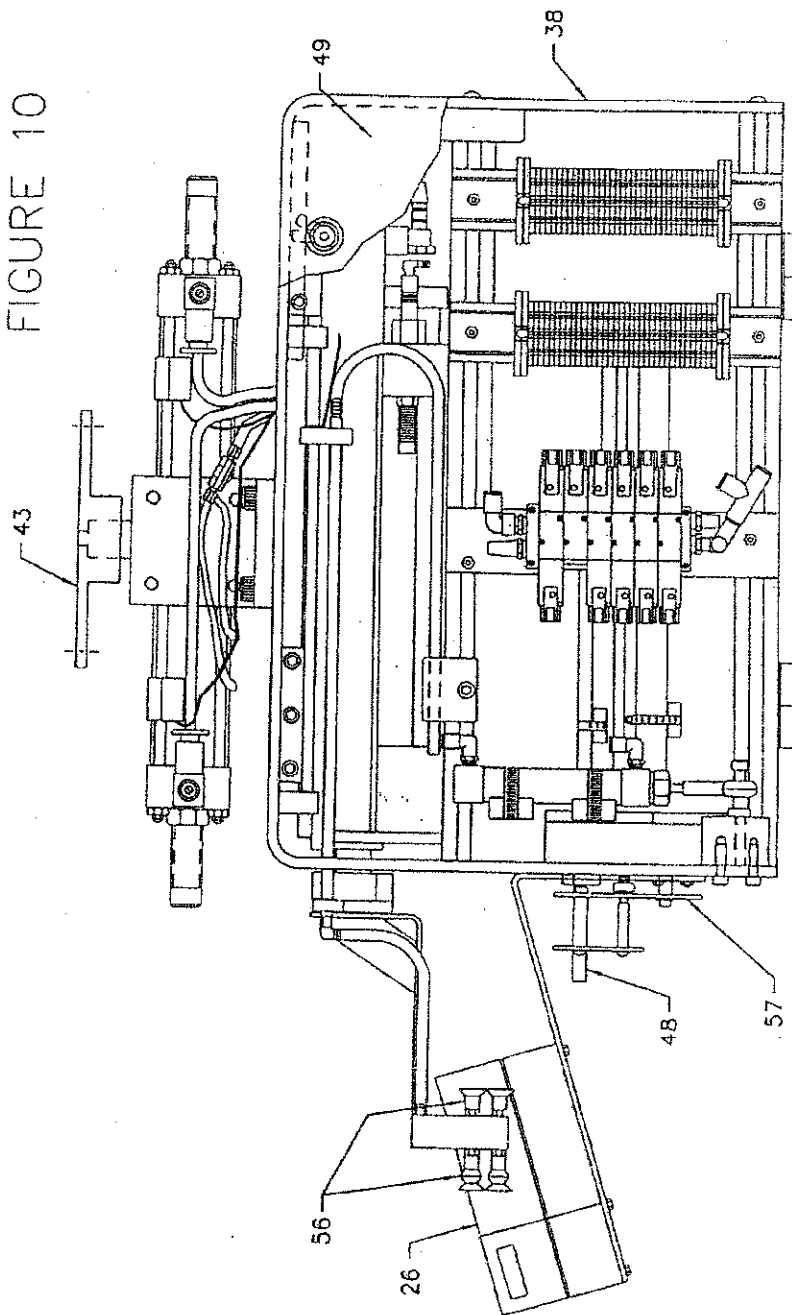
FIGURE 9



APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
ORATISHAN		

295495

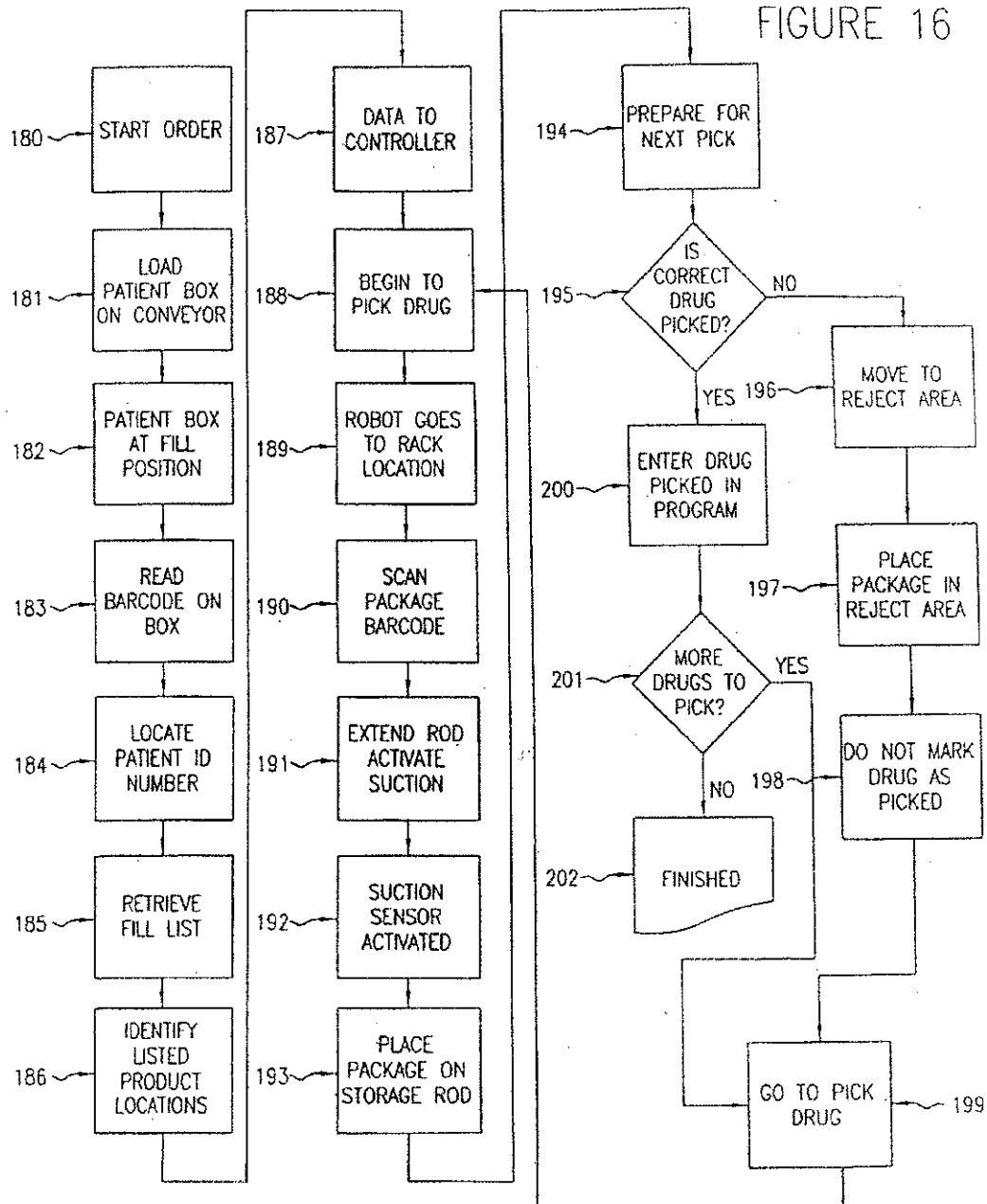
FIGURE 10

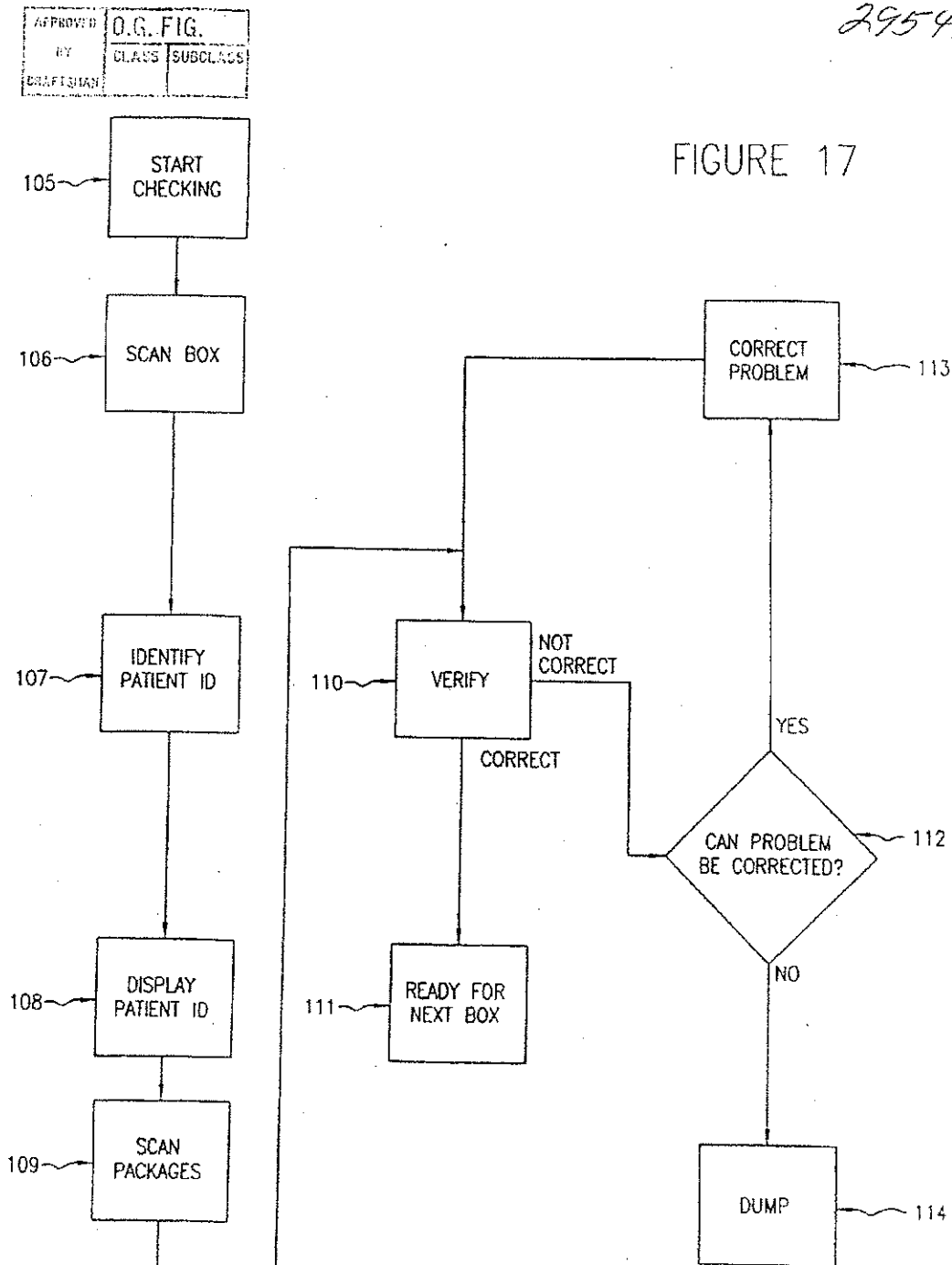


APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DATE		

295445

FIGURE 16

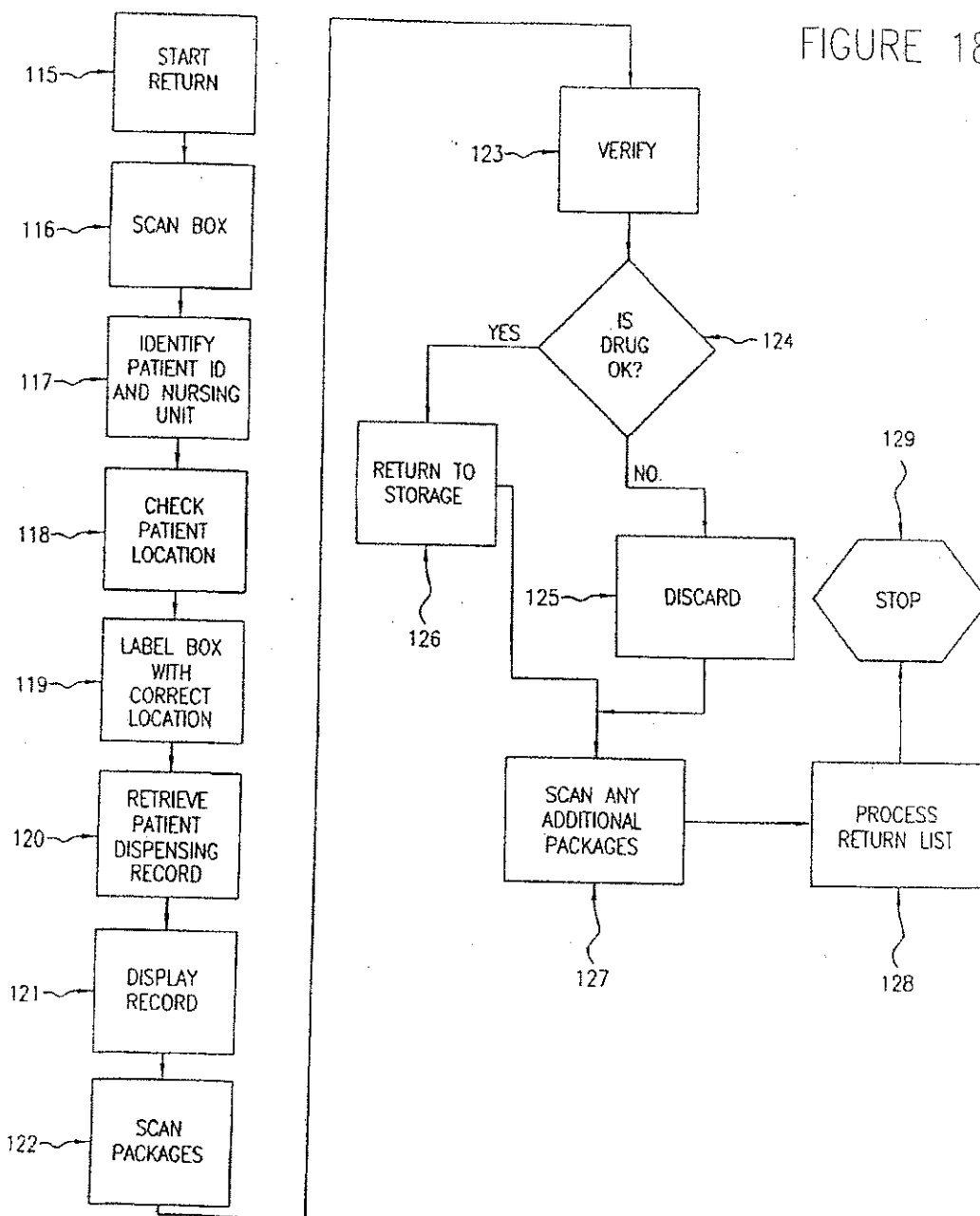




APPROVED	O.G. FIG.
BY	CLASS
DATE/TIME	SUBCLASS

295795

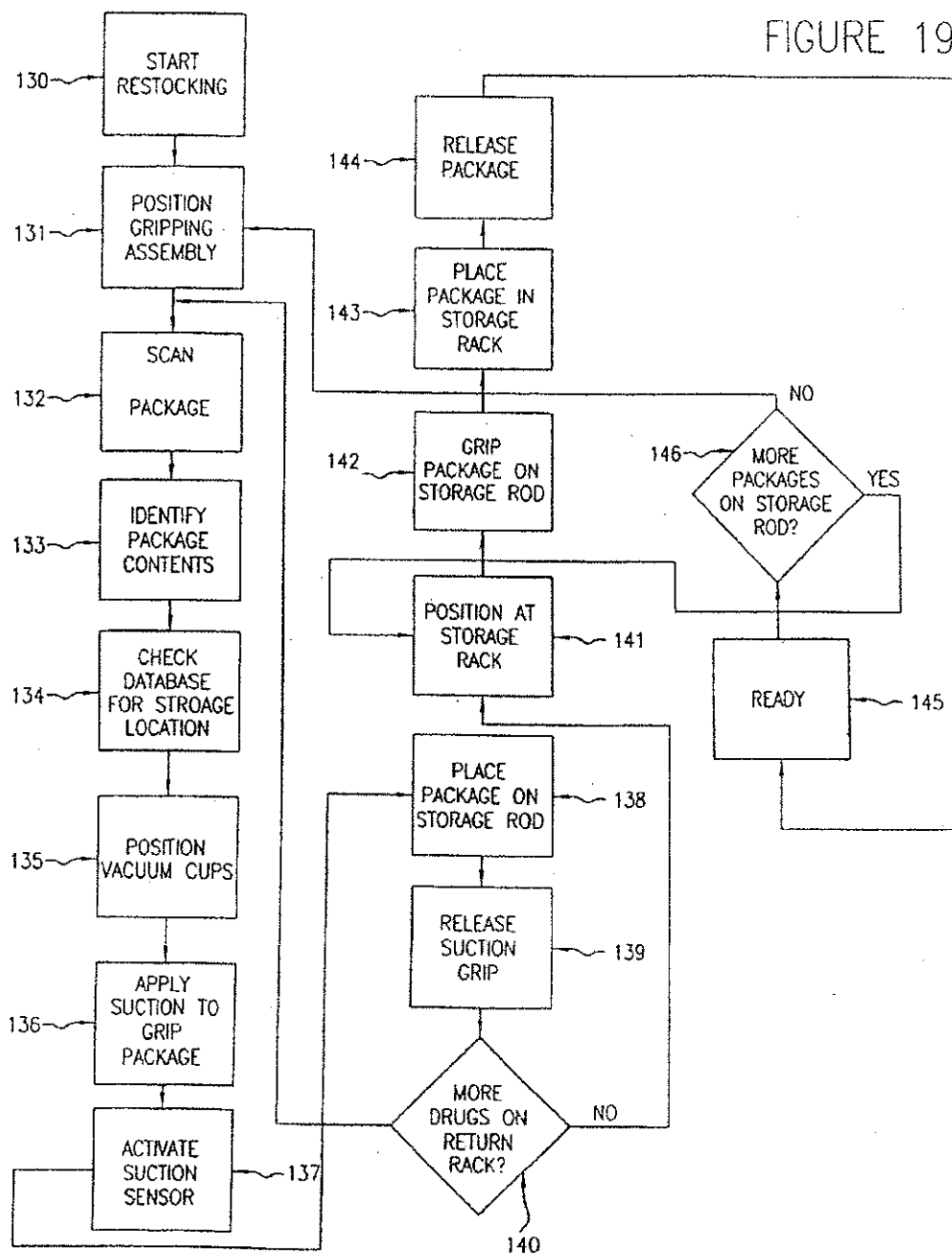
FIGURE 18



APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

295495

FIGURE 19



The dating stamp of
the Patent Office on this
card will be taken as an
indication that the accom-
panying paper was filed.

Letter

7 sheets of formal
drawings

Applicant(s) McDonald et al

A copy of draft-
person's patent
drawing review

Ser. No. 08/295,495

Paper dated April 25, 1995

Atty's File No. 940688/lja



PTO FORM 948
(Rev. 5-91)U.S. DEPARTMENT OF COMMERCE
Patent and Trademark Office

ATTACHMENT TO PAPER NUMBER

5

APPLICATION NUMBER

821,832

GROUP 3107

NOTICE OF DRAFTSMAN'S PATENT DRAWING REVIEW

The PTO Draftsmen review all originally filed drawings regardless of whether they were designated as Informal or formal.

The drawings filed 4/21/72A. ☐ are approved.B. ☒ are objected to under 37 CFR 1.84 for reason(s) checked below. The applicant will require submission of new, corrected drawings at the appropriate time. Corrected drawings must be submitted according to the instructions listed on the back of this Notice.

1. Paper and Ink. 37 CFR 1.84(a)

☐ Poor Quality Paper. Must Be White.
Transparent Paper Not Allowed.
Sheet(s) _____

2. Size of Sheet and Margins. 37 CFR 1.84(b)

Acceptable Paper Sizes and Margins

Paper Size

Margin	8 1/2 by 14 inches	6 1/2 by 13 inches	DIN size A4 21 by 29.7 cm
Top	2 inches	1 inch	2.5 cm
Left	1/4 inch	1/4 inch	2.5 cm
Right	1/4 inch	1/4 inch	1.5 cm
Bottom	1/4 inch	1/4 inch	1.0 cm

☐ Proper Size Paper Required. All
Sheets Must Be Same Size.
Sheet(s) _____☐ Proper Margins Required.Sheet(s) _____
☐ Top ☐ Right
☐ Left ☐ Bottom

3. Character of Lines. 37 CFR 1.84(c)

☐ Lines Pale, Rough and Blurred, or
Jagged. Fig(s) _____☐ Solid Black Shading Not Allowed.
Fig(s) _____4. ☐ Photographs Not Approved.☒ Comments:

- Remove box from drawing 1051 fig 10

5. Hatching and Shading. 37 CFR 1.84(d)

☐ Shade Lines are Required.
Fig(s) _____☐ Criss-Cross Hatching Not Allowed
Fig(s) _____☐ Double Line Hatching Not Allowed.
Fig(s) _____☐ Parts in Section Must be Hatched
Properly. Fig(s) _____

6. Reference Characters. 37 CFR 1.84(f)

☐ Reference Characters Poor or Rough
and Blurred. Fig(s) _____☐ Minimum 1/8 inch (3.2 mm.) in height
is required. Fig(s) 9-16, 16-17☐ Figure Legends Poor or Placed
Incorrectly. Fig(s) 17 1051

7. Views. 37 CFR 1.84(i) & (j)

☐ Figures Must Be Numbered Separately.☐ Figures Must Not Be Connected
Fig(s) _____

8. Identification of Drawings. 37 CFR 1.84(i)

☐ Extraneous Matter or Copy Machine
Marks Not Allowed. Fig(s) _____9. ☐ Changes Not Completed from Prior
PTO-948 dated _____

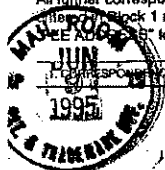
Telephone inquiries concerning this review should be directed to the Chief Draftsman or telephone number (703) 471-5404

Chief Draftsman_____
Date

Applicant's Copy

605-242
PART B—ISSUE FEE TRANSMITTAL

MAILING INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE. Blocks 2 through 6 should be completed where appropriate. All further correspondence including the Issue Fee Receipt, the Patent, advance orders and notification of maintenance fees will be mailed to addressee listed in Block 1 unless you direct otherwise, by: (a) specifying a new correspondence address in Block 3 below; or (b) providing the PTO with a separate "Change of Address" form for maintenance fee notifications with the payment of Issue Fee or thereafter. See reverse for Certificate of Mailing.



LYNN J. ALSTADT
BUCHANAN INGERSOLL
600 GRANT STREET, 56TH FLOOR
PITTSBURGH, PA 15219

FIM1/0307

2. INVENTOR(S) ADDRESS CHANGE (Complete only if there is a change)

INVENTOR'S NAME

Street Address

City, State and ZIP Code

CO-INVENTOR'S NAME

Street Address

City, State and ZIP Code

☐ Check if additional changes are on reverse side

SERIES CODE/SERIAL NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
08/295,495	08/25/94	022	WERNER, F 3107	03/07/95
First Named Applicant	MCDONALD, SEAN C.			

TITLE OF INVENTION: AUTOMATED SYSTEM FOR SELECTING PACKAGES FROM A STORAGE AREA

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPL. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
3 920015	414-273.000	J50	UTILITY	YES	\$605.00	06/07/95

3. Correspondence address change (Complete only if there is a change)

4. For printing on the patent front page, list the names of not more than 3 registered patent attorneys or agents OR, alternatively, the name of a firm having as a member a registered attorney or agent. If no name is listed, no name will be printed.

1 Buchanan Ingersoll

2 Lynn J. Alstadt

3

DO NOT USE THIS SPACE

160 KJ 07/06/95 08295495

1 242 605.00 CK

5. ASSIGNMENT DATA TO BE PRINTED ON THE PATENT (print or type)

(1) NAME OF ASSIGNEE:
Automated Healthcare, Inc.
(2) ADDRESS (CITY & STATE OR COUNTRY):
Pittsburgh, PA

- A ☐ This application is NOT assigned.
☒ Assignment previously submitted to the Patent and Trademark Office.
☐ Assignment is being submitted under separate cover. Assignments should be directed to Box ASSIGNMENTS.

PLEASE NOTE: Unless an assignee is identified in Block 5, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the PTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

6a. The following fees are enclosed:

☒ Issue Fee ☐ Advance Order - # of Copies

6b. The following fees should be charged to:

DEPOSIT ACCOUNT NUMBER 02-4553

(ENCLOSE PART C)

☐ Issue Fee ☐ Advance Order - # of Copies☒ Any Deficiencies in Enclosed Fees

The COMMISSIONER OF PATENTS AND TRADEMARKS is requested to apply the Issue Fee to the application identified above.

(Authorized Signature)

(Date)

NOTE: The Issue Fee will not be accepted from anyone other than the applicant, a registered attorney or agent, or the assignee or other party in interest as shown by the records of the Patent and Trademark Office.

TRANSMIT THIS FORM WITH FEE-CERTIFICATE OF MAILING ON REVERSE

PTOL-858 (REV.12-93)(0651-0033)

MA000263

Certificate of Mailing

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to:

Box ISSUE FEE
Commissioner of Patents and Trademarks
Washington, D.C. 20231

on June 7, 1995

(Date)

Vicki Cremonese

(Name of person making deposit)

Vicki Cremonese

(Signature)

June 7, 1995

(Date)

Note: If this certificate of mailing is used, it can only be used to transmit the Issue Fee. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing.

Burden Hour Statement: This form is estimated to take .2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Office of Information Systems, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, (Project 0651-0033), Washington, D.C. 20503. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner of Patents and Trademarks, Box Issue Fee, Washington, DC 20231.


**UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office**

 Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
08/293,495	08/23/94	MCDONALD	S 920015

 4102/0816
 LYNN J. ALSTADT
 BUCHANAN INGERHOLL
 800 GRANT STREET, 56TH FLOOR
 PITTSBURGH, PA 15219

DEPT. EXAMINER	
ART UNIT	PAPER NUMBER
3107	17

DATE MAILED:

08/16/95

NOTICE OF OUTSTANDING DRAWING REQUIREMENT

Office records indicate that the requirement for

- ☒ formal drawings
☐ drawing corrections
☐

which was made in the form PTOL-37

- ☒ attached to the Notice of Allowance and Issue Fee Due mailed 3/7/95
☐ mailed _____

has not been satisfied. As set forth in the form PTOL-37 and form PTO-1474, required drawing corrections must have been made by a bonded draftsman or new drawings submitted during the three month statutory period set for payment of the issue fee. The three month period for payment of the issue fee is a statutory requirement (35 USC 151) and cannot be extended. However, drawing corrections and new formal drawings will be accepted as timely filed through the end of a six month statutory period (35 USC 133), provided a request for extension of time and the correct fee in accordance with 37 CFR 1.136(a) is submitted before the end of the six month period. The required fees are set forth in 37 CFR 1.17(a), (b), and (c). If the requirements are not satisfied within the statutory period, this application will be abandoned.

 Brenda Moore
 Drawing Processing Branch
 703-305-8428

 Drafting Branch
 Office of Publications

*The
United
States
of
America*



PTO-1584

PTO UTILITY GRANT

Paper Number 19

The Commissioner of Patents
and Trademarks

*Has received an application for a patent
for a new and useful invention. The title
and description of the invention are en-
closed. The requirements of law have
been complied with, and it has been de-
termined that a patent on the invention
shall be granted under the law.*

Therefore, this

United States Patent

*Grants to the person or persons having
title to this patent the right to exclude
others from making, using or selling the
invention throughout the United States
of America for the term of seventeen
years from the date of this patent, sub-
ject to the payment of maintenance fees
as provided by law.*

Bence Lehman

Commissioner of Patents and Trademarks

Pandra L. Morton
Attest

(RIGHT INSIDE)

FPI-10M



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit 3107

: PATENT APPLICATION

In re application of

SEAN C. MCDONALD ET AL.

: AUTOMATED SYSTEM FOR
SELECTING PACKAGES FROM
A STORAGE AREA

Serial No. 295,495

Filed August 25, 1994

Patent No. 5,468,110

Issued November 21, 1995

LETTER

Pittsburgh, Pennsylvania 15219
January 8, 1996Hon. Commissioner of Patents and Trademarks
Washington, D. C. 20231

Sir:

Applicant requests that a Certificate of Correction be issued to correct the errors which are indicated on the attached form for Certificate of Correction.

Respectfully submitted,

Lynn J. Alstadt
Lynn J. Alstadt
Registration No. 29,362
BUCHANAN INGERSOLL, P.C.
One Oxford Centre
301 Grant Street, 20th Floor
Pittsburgh, PA 15219
(412) 562-1632

APPROVED

MAR 19 1996

Mary J. Queen
FILE THE APPLICATION IN THE U.S. PAT. & TRADEMARK OFF.RECEIVED
FEB-8 96

Staple
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Only!

PRINTER'S TRIM LINE

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 5,468,110

DATED : November 21, 1995

INVENTOR(S) : SEAN C. McDONALD, ELLEN J. HERTZ, JAMES A. SMITH, GREGORY TOTO

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 1, line 6, change "07/87/832" to --07/871,832--.

Column 14, lines 47-48, claim 20, delete "[on either the first or".

MAILING ADDRESS OF SENDER: Lynn J. Alstadt
BUCHANAN INGERSOLL, P.C.
301 Grant Street, 20th Floor
Pittsburgh, PA 15219

PATENT NO. 5,468,110

No. of add'l copies
@ 50¢ per page

FORM PTO 1050 (Rev. 2-93)

MA000268

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 5,468,110

DATED : November 21, 1995

INVENTOR(S) : SEAN C. McDONALD, ELLEN J. HERTZ, JAMES A. SMITH, GREGORY TOTO

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 1, line 6, change "07/87/832" to --07/871,832--.

Column 14, lines 47-48, claim 20, delete "[on either the first or"]

Signed and Sealed this
Sixteenth Day of April, 1996

Attest:



BRUCE LEHMAN

Attesting Officer

Commissioner of Patents and Trademarks

PATENT APPLICATION FEE DETERMINATION RECORD					Application or Docket Number 295 495		
Effective October 1, 1992							
CLAIMS AS FILED - PART I					SMALL ENTITY OR OTHER THAN SMALL ENTITY		
FOR	NUMBER FILED	NUMBER EXTRA	RATE	FEE	RATE	FEE	
BASIC FEE				\$355.00		\$710.00	
TOTAL CLAIMS	24	4	x\$11=	44	x\$22=		
INDEPENDENT CLAIMS	2		x\$37=		x\$74=		
MULTIPLE DEPENDENT CLAIM PRESENT			+115=		+230=		
* If the difference in column 1 is less than zero, enter "0" in column 2.					TOTAL	399	
CLAIMS AS AMENDED - PART II					SMALL ENTITY OR OTHER THAN SMALL ENTITY		
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE
Total	23	24		x\$11=		x\$22=	
Independent	1	3		x\$37=		x\$74=	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				+115=		+230=	
					TOTAL ADDIT. FEE		
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE
Total				x\$11=		x\$22=	
Independent				x\$37=		x\$74=	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				+115=		+230=	
					TOTAL ADDIT. FEE		
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE
Total	28			x\$11=		x\$22=	
Independent				x\$37=		x\$74=	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				+115=		+230=	
					TOTAL ADDIT. FEE		

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
 ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
 *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
 The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

FORM PTO-875
(Rev. 10-92)

Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

MA000270

4 U.S.G.P.O.: 1994-385-974

APPROVED	O.G. FIG. 6	
BY	CLASS	SUBCLASS
PROFESSOR	411	B23

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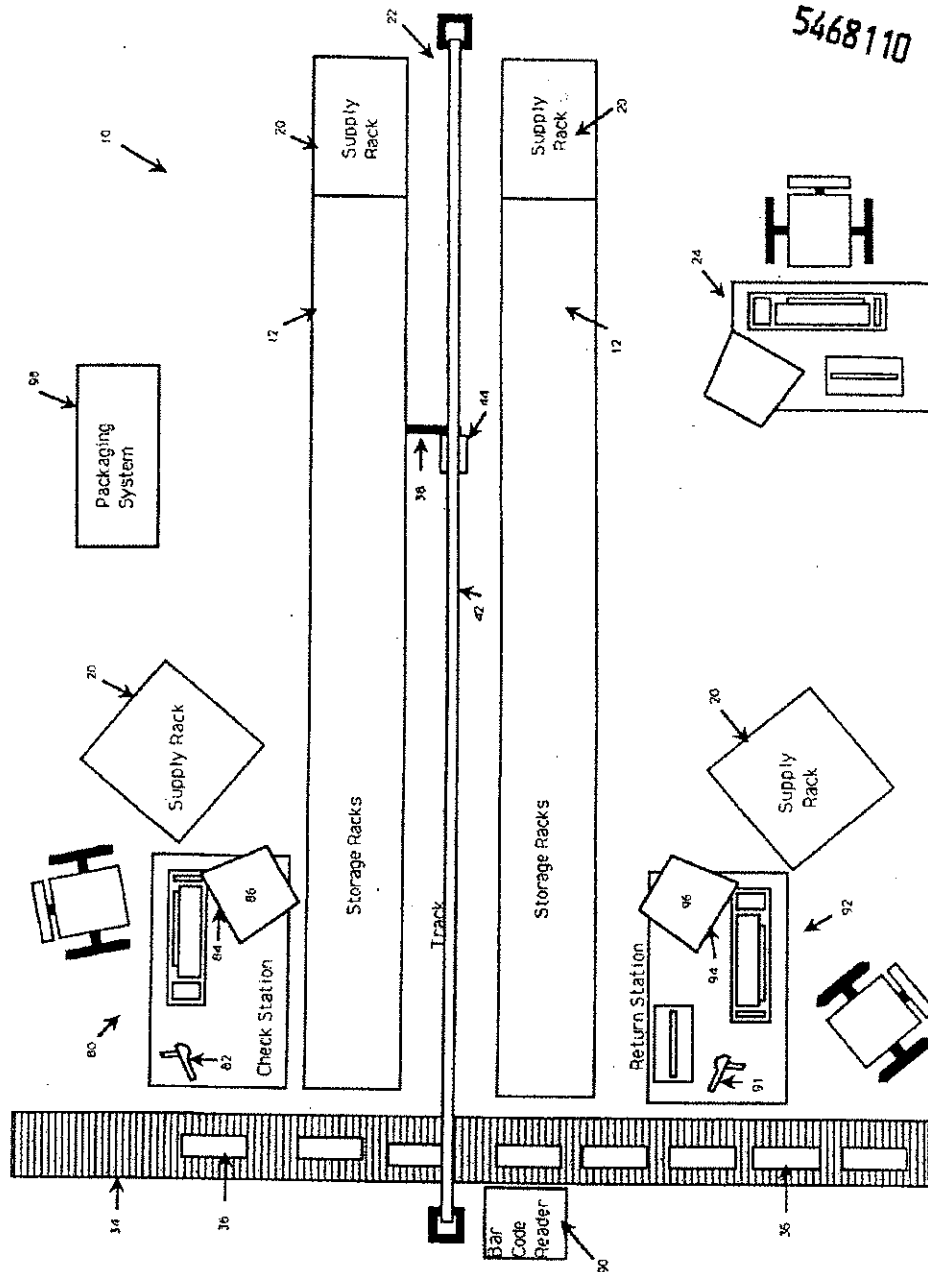


Figure 1

APPROVED	D.G. FIG.	
BY	CLASS	SUBCLASS
DATE		

895495

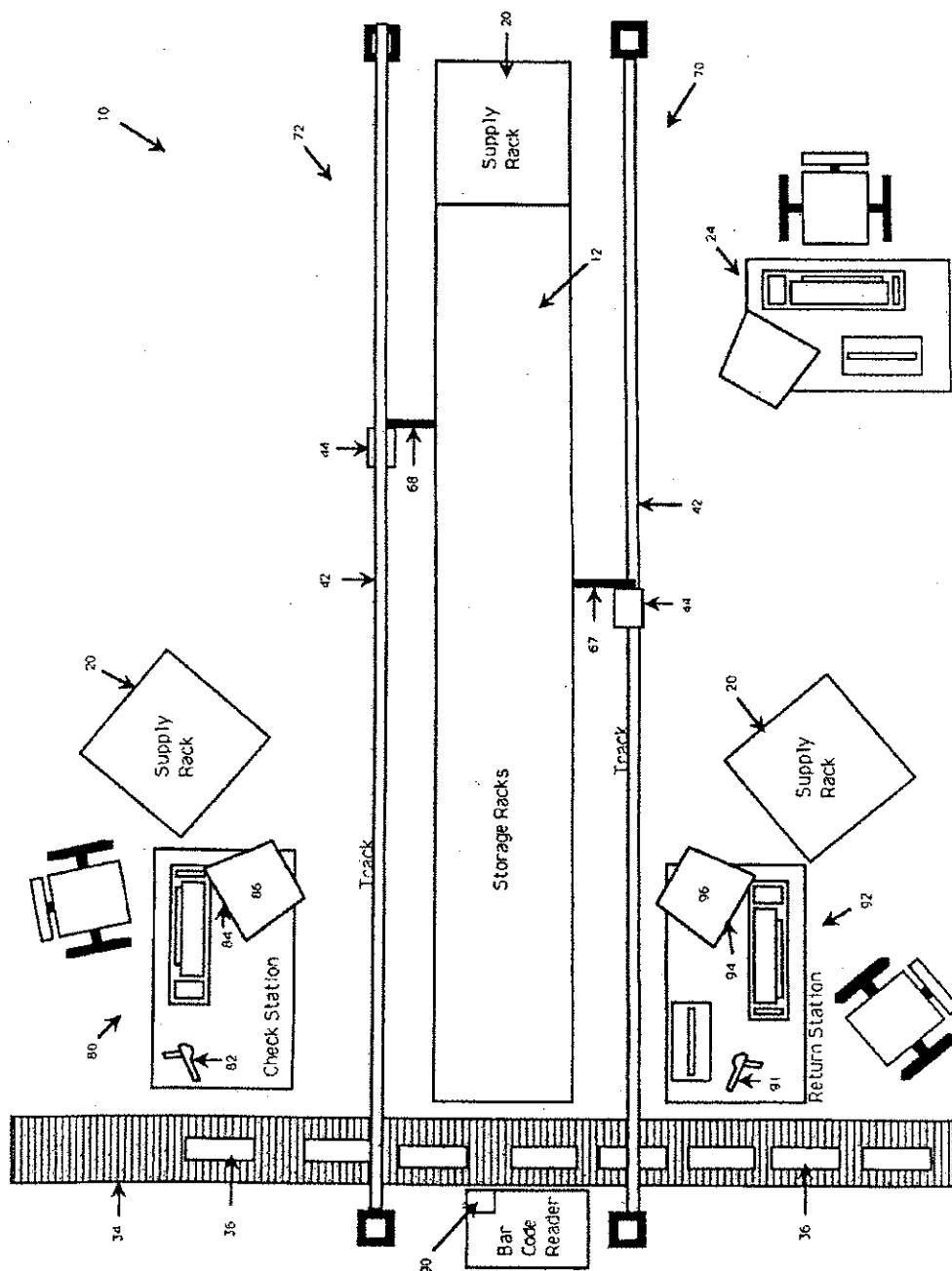


EXHIBIT I

44 273		273	Class	Subclass	ISSUE CLASSIFICATION	[REDACTED]		5593267
UTILITY SERIAL NUMBER 09/452646		PATENT DATE		PATENT NUMBER		5593267		
SERIAL NUMBER 08/452,646	FILING DATE 05/25/95 RULE 60	CLASS 414	SUBCLASS 211	GROUP ART UNIT 3107	EXAMINER [REDACTED]			
APPLICANTS: SEAN C. McDONALD, PITTSBURGH, PA; ELLEN J. HERTZ, CLEMMONS, NC; JAMES A. SMITH, ALLISON PARK, PA; GREGORY TOTO, SANTA CRUZ, CA.								
CONTINUING DATA VERIFIED THIS APPLN IS A DIV OF 08/295,485 08/25/94, now Patent No. 5,148,110 WHICH IS A CON OF 07/871,832 04/21/92, now abandoned WHICH IS A QIP OF 07/469,217 01/24/90 ABN								
FOREIGN/PCT APPLICATIONS VERIFIED NONE								
***** SMALL ENTITY *****								
Foreign priority claimed 35 USC 119 conditions met		<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	AS FILED	STATE OR COUNTRY PA	SHEETS DRWGS. 19	TOTAL CLAIMS 12	INDEP. CLAIMS 1	FILING FEE RECEIVED \$265.00
Verified and Acknowledged		Examiner's Initials		ATTORNEYS DOCKET NO. 950401				
ADDRESS: BUCHANAN INGERSOLL P.C. 20th floor 400 GRANT STREET 301 PITTSBURGH PA 15219-1410		ISSUE FEE IN FILE						
AUTOMATED SYSTEM FOR SELECTING AND DELIVERING PACKAGES FROM A STORAGE AREA U.S. DEPT. OF COMM. / PAT. & TM—PTO-436L (Rev. 12-)								
PARTS OF APPLICATION FILED SEPARATELY		NOTIFICATION OF ALLOWANCE MAILED JUN - 6 1996 Assistant Examiner [Signature]						
ISSUE FEE		Amount Due \$625.00		Date Paid 9/5/96		CLAIMS ALLOWED Total Claims 11 Print Claim 1		
Label Area		FRANK E. WERNER PRIMARY EXAMINER GROUP 3100 Primary Examiner		DRAWING Sheets Drwg. 19 Figs. Drwg. 19 Print Fig. 6 ISSUE BATCH NUMBER A72				
PREPARED FOR ISSUE		WARNING: The information disclosed herein may be restricted. Unauthorized disclosure may be prohibited by the United States Code Title 35, Sections 122, 181 and 368. Possession outside the U.S. Patent & Trademark Office is restricted to authorized employees and contractors only.						

Form PTO-436A
(Rev. 8/92)

(FACE)

MA000275

08/452646

Date
Entered
or
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PATENT APPLICATION



08452646

CONTENTS

APPROVED FOR LICENSE

JUN 15 1995

INITIALS

GROUP

S. 1995

Date

Received

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Mailed

1. Application 19 drawings papers.	May 25, 1995
2. Info Dir. State	AUG 21 1995 87
3. Rej 3M	Aug 7, 1995
4. Change of Address	Nov 24 1995
5. Amdt A (Jan 11-21-95)	Nov 28 1995
6. Letter	Jan 18 1996 3/4
7. Dir. Rej. 3M	May 22, 1996
8. Amdt B (Re)	JUN 6 1996 4/6
9. P34-37	9/6/96
10. [unclear] 10	9/12/96
11. Notice of Drawing Requirement	10/3/96
12. [unclear] 6 2	
13. PTO Grant JAN 14 1997	
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U.S. GOVERNMENT PRINTING OFFICE: 1994-365-311

PATENT NUMBER		ORIGINAL CLASSIFICATION	
		CLASS	SUBCLASS
		414	273
APPLICATION SERIAL NUMBER		CROSS REFERENCE(S)	
08/452646			
APPLICANT'S NAME (PLEASE PRINT)		CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)
Sean C. McDonald et al.		414	280
IF REISSUE, ORIGINAL PATENT NUMBER			
INTERNATIONAL CLASSIFICATION			
B65G 001/04			
		GROUP ART UNIT	ASSISTANT EXAMINER (PLEASE STAMP OR PRINT FULL NAME)
		3107	FRANK E. WEBNER
			PRIMARY EXAMINER (PLEASE STAMP OR PRINT FULL NAME)
			FRANK E. WEBNER
PTO 273 (REV. 5-91)		ISSUE CLASSIFICATION SLIP	
		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	

Claim	Date
Final	Original
1	8/2/06
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SYMBOLS

✓ Rejected

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A Interference

O Appeal

○ Rejected

Claim	Date
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MA000277

POSITION	ID NO.	DATE
CLASSIFIER	31	6/16/95
EXAMINER	320	6.21.95
TYPIST	323	6/21
VERIFIER		
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SPEC. HAND		
FILE MAINT.		
DRAFTING		

INDEX OF CLAIMS

Claim	Date
Final Original	
1	5/26/96
2	
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Claim	Date
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SYMBOLS

✓ Rejected

□ Allowed

- (Through numbers) Cancelled

+ Restricted

N Non-elected

I Interference

A Appeal

Q Objected

(LEFT INSIDE)

SEARCHED			
Class	Sub.	Date	Exmr.
235	385, 351		
414	266, 267 268, 269 270, 273 274, 276 277, 280 281, 282 285, 331		
221	3, 5, 4, 15		
364	478, 412, 2 479	8/85	RW
Above search updated		2/96	RW
Above search updated		6/96	RW

[illegible][illegible]

(RIGHT OUTSIDE)



US005593267A

United States Patent [19]

McDonald et al.

[11] Patent Number: 5,593,267

[45] Date of Patent: Jan. 14, 1997

[54] **AUTOMATED SYSTEM FOR SELECTING AND DELIVERING PACKAGES FROM A STORAGE AREA**[75] Inventors: Sean C. McDonald, Pittsburgh, Pa.;
Ellen J. Hertz, Clemmons, N.C.;
James A. Smith, Allison Park, Pa.;
Gregory Toto, Santa Cruz, Calif.[73] Assignee: Automated Healthcare, Inc.,
Pittsburgh, Pa.

[21] Appl. No.: 452,646

[22] Filed: May 25, 1995

Related U.S. Application Data

[62] Division of Ser. No. 295,495, Aug. 25, 1994, Pat. No. 5,468,110, which is a continuation of Ser. No. 871,832, Apr. 21, 1992, abandoned, which is a continuation-in-part of Ser. No. 469,217, Jan. 24, 1990, abandoned.

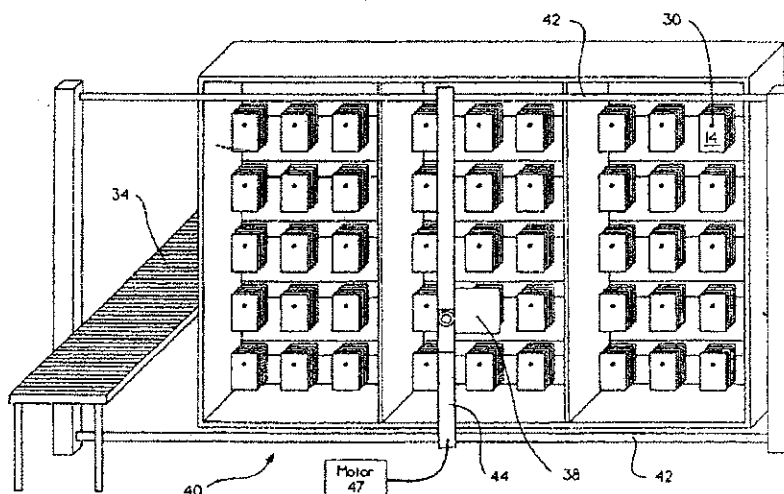
[51] Int. Cl.⁶ B65G 1/04

[52] U.S. Cl. 414/273; 414/280

[58] Field of Search 235/385, 351;
414/266, 267, 268, 269, 270, 273, 274,
276, 277, 280, 281, 282, 285, 331; 221/3,
5, 9, 15; 364/478, 413.02, 479[56] **References Cited****U.S. PATENT DOCUMENTS**3,802,580 4/1974 Castaldi 414/280
3,986,612 10/1976 Kamm et al. 209/111.7
4,546,901 10/1985 Butarazzi 414/280
4,651,863 3/1987 Reuter et al. 414/2804,669,047 5/1987 Chocta 414/331
4,678,390 7/1987 Bonneton et al. 414/282
4,786,229 11/1988 Henderson 414/273
4,789,295 12/1988 Boucher, Jr. et al. 414/280
4,792,270 12/1988 Yoshida 414/273
4,812,629 3/1989 O'Neill et al. 414/274
4,820,109 4/1989 Witt 414/282
4,896,024 1/1990 Morello et al. 414/274
5,129,777 7/1992 Pohjonen et al. 414/280**FOREIGN PATENT DOCUMENTS**304 1/1979 European Pat. Off. 414/273
2596299 10/1987 France
85/00232 8/1984 WIPOPrimary Examiner—Frank E. Werner
Attorney, Agent, or Firm—Buchanan Ingersoll, P.C.; Lynn J. Alstadt[57] **ABSTRACT**

A system for filling orders, such as prescriptions for patients, comprising a device for holding packages. Each package has the same type of contents being held in a predetermined location by the holding device. Each package has an identity which defines the contents therein. The holding device has a plurality of predetermined locations corresponding to a plurality of different types of contents. Additionally, the system is comprised of a device for supplying packages to the holding device. Also, there is a device for picking a package from the holding device that is identified in the order for the purpose of restocking the holding device. The picking device is in communication with the holding device and supplying device. In a preferred embodiment, the contents of each package is a single dosage of medicine.

11 Claims, 19 Drawing Sheets

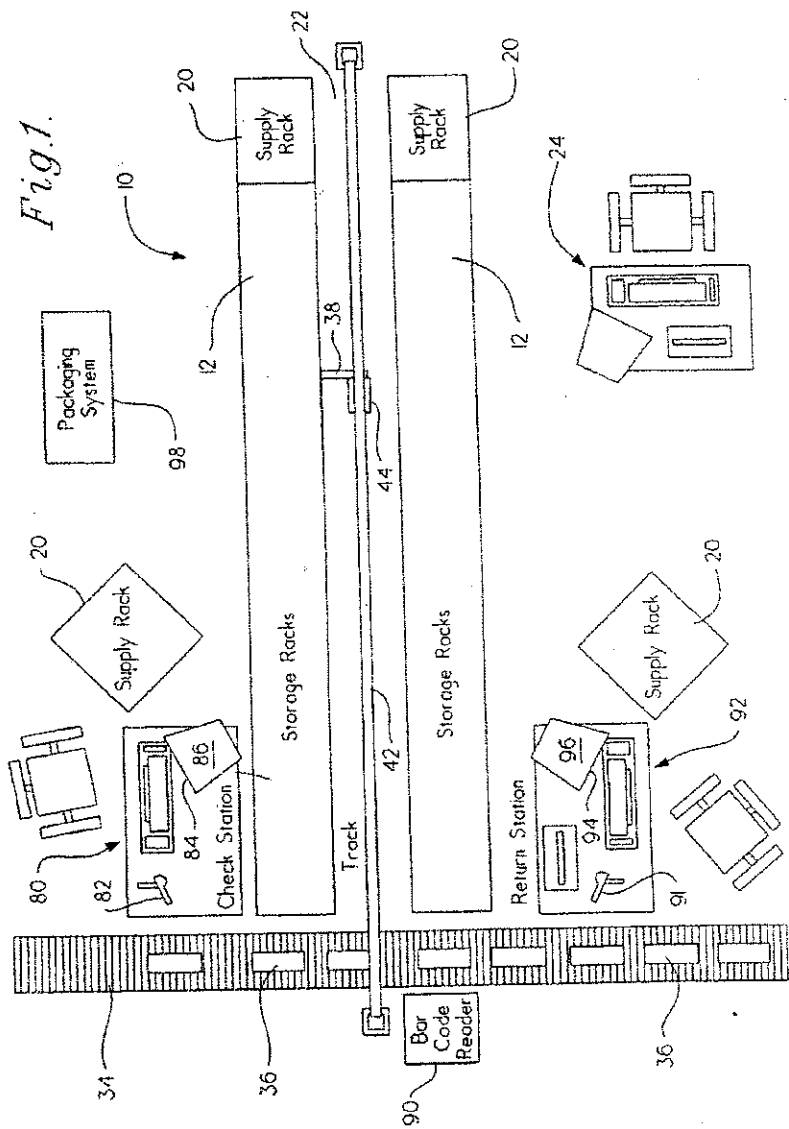


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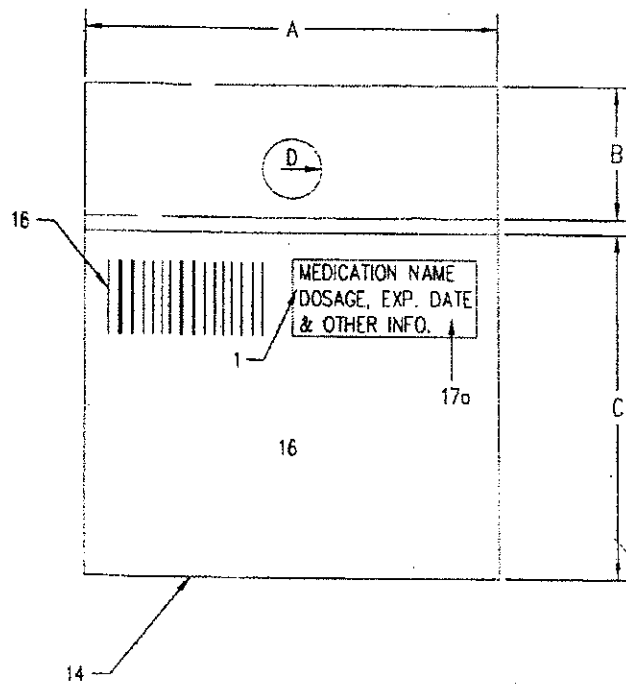
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FIGURE 2



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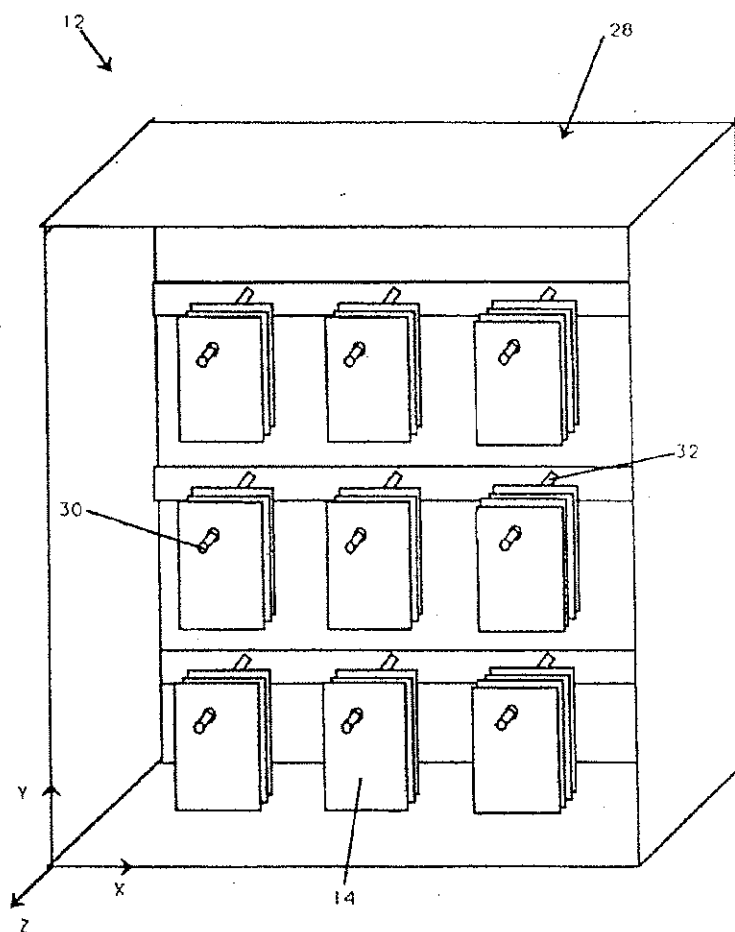


FIGURE 3

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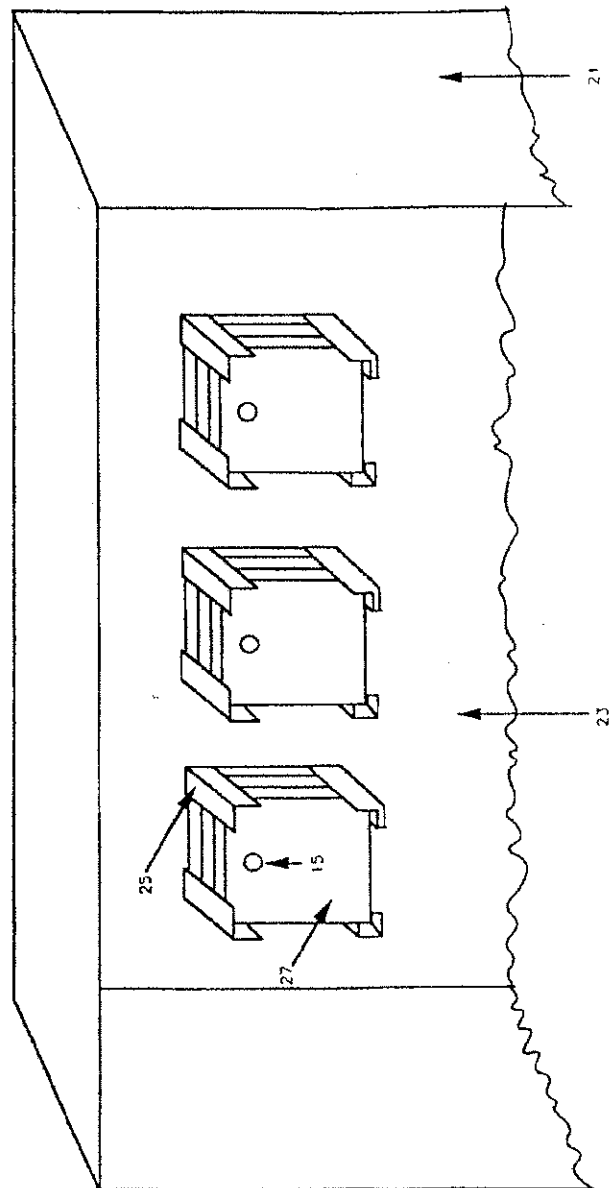


Figure 4

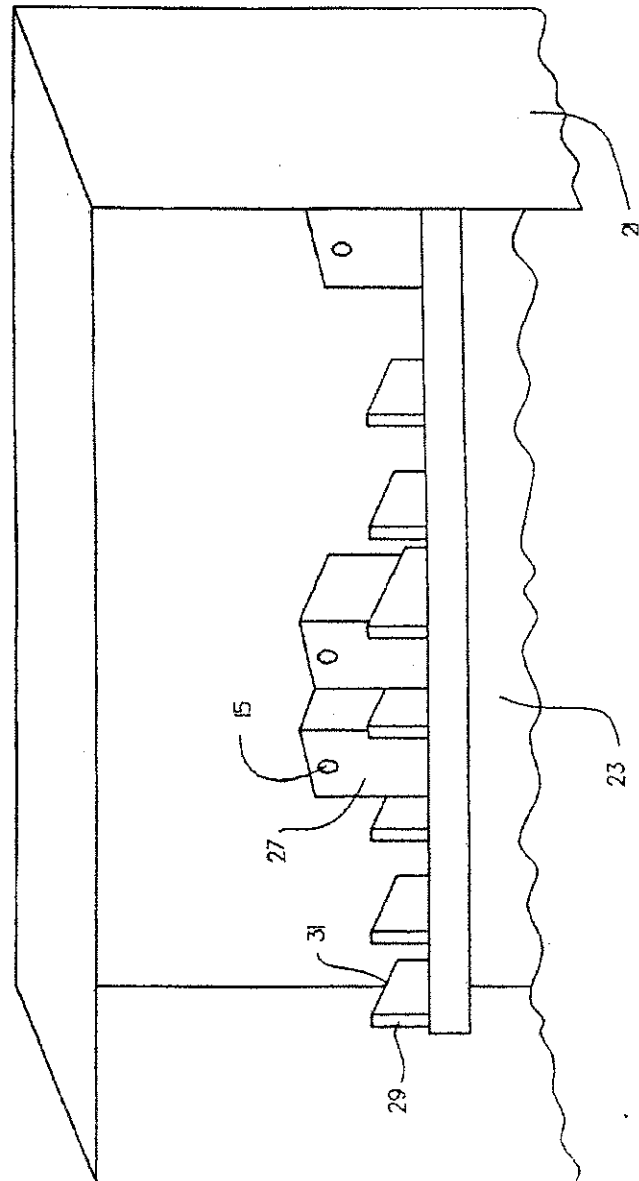
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Figure 5

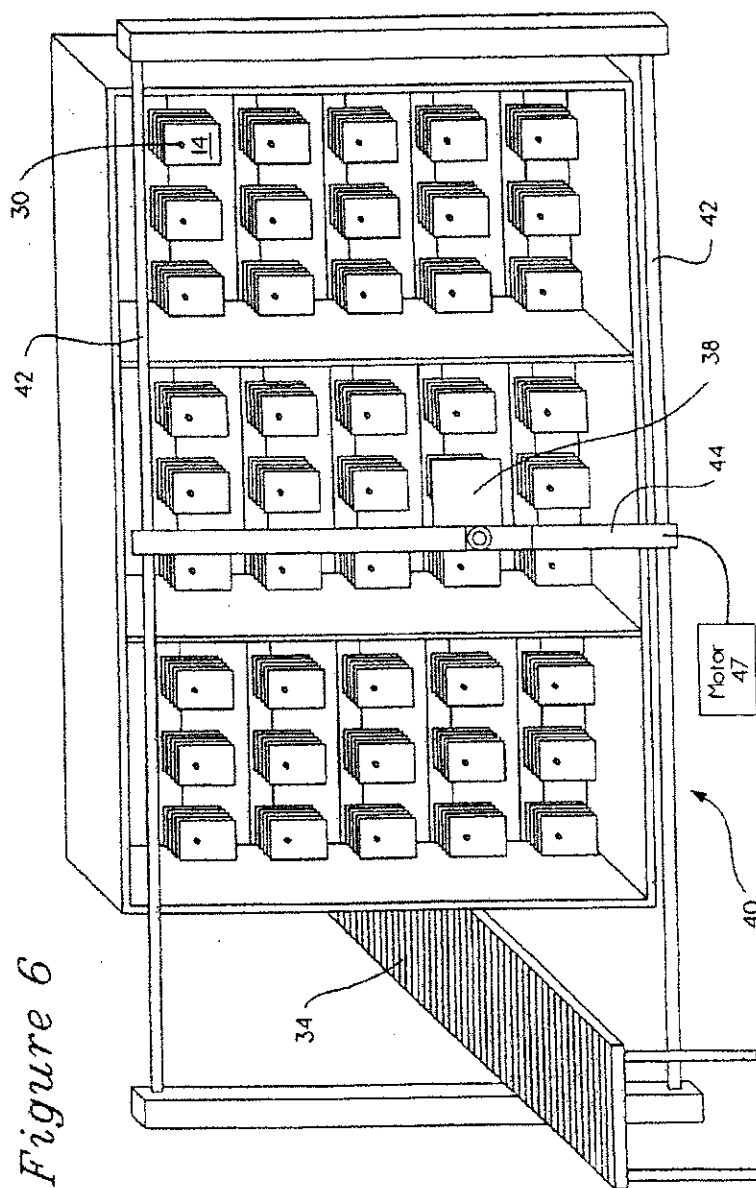


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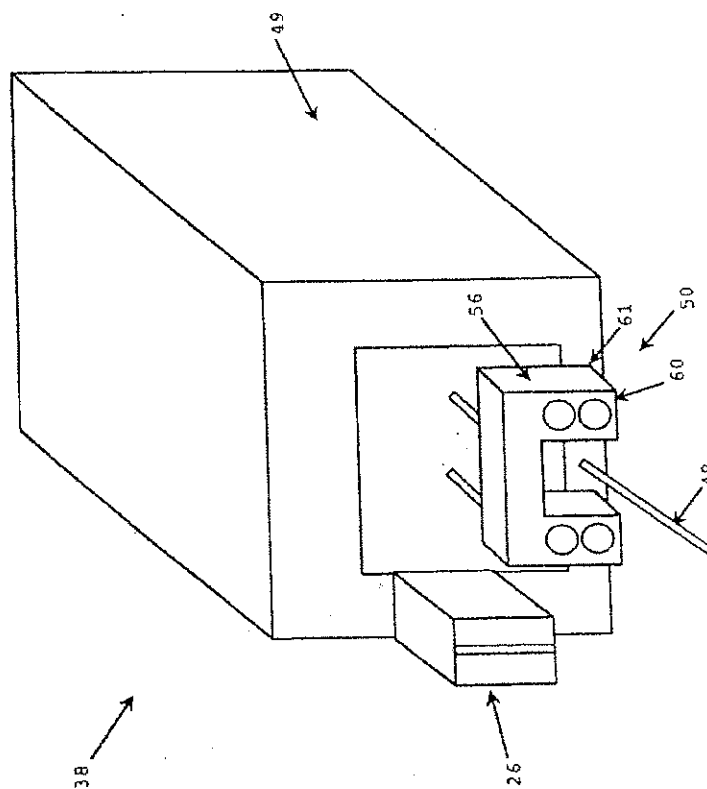


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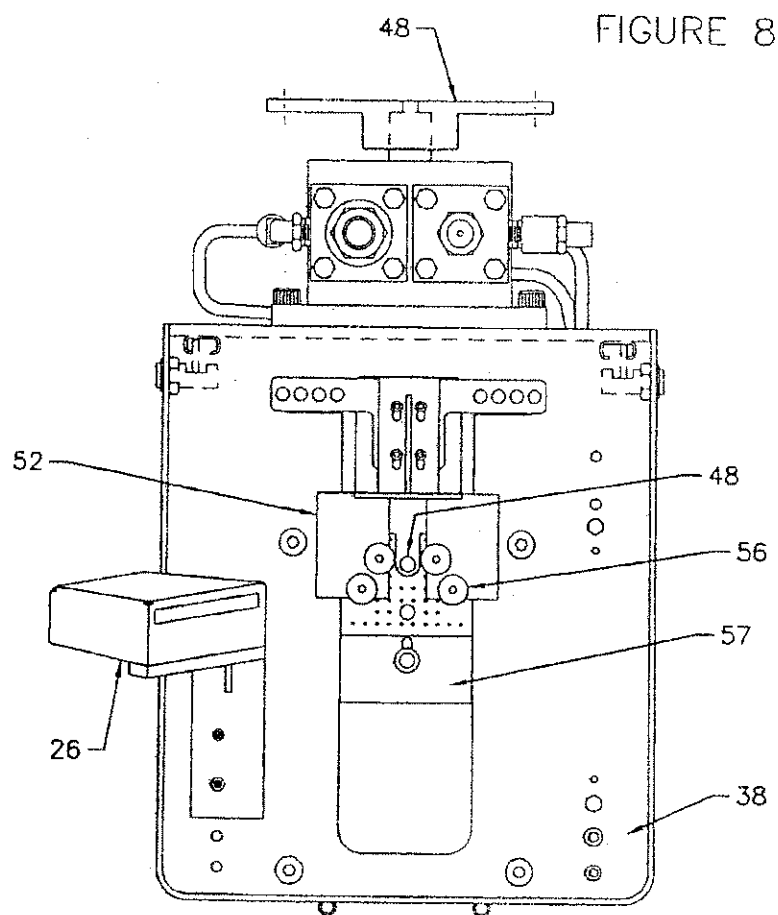


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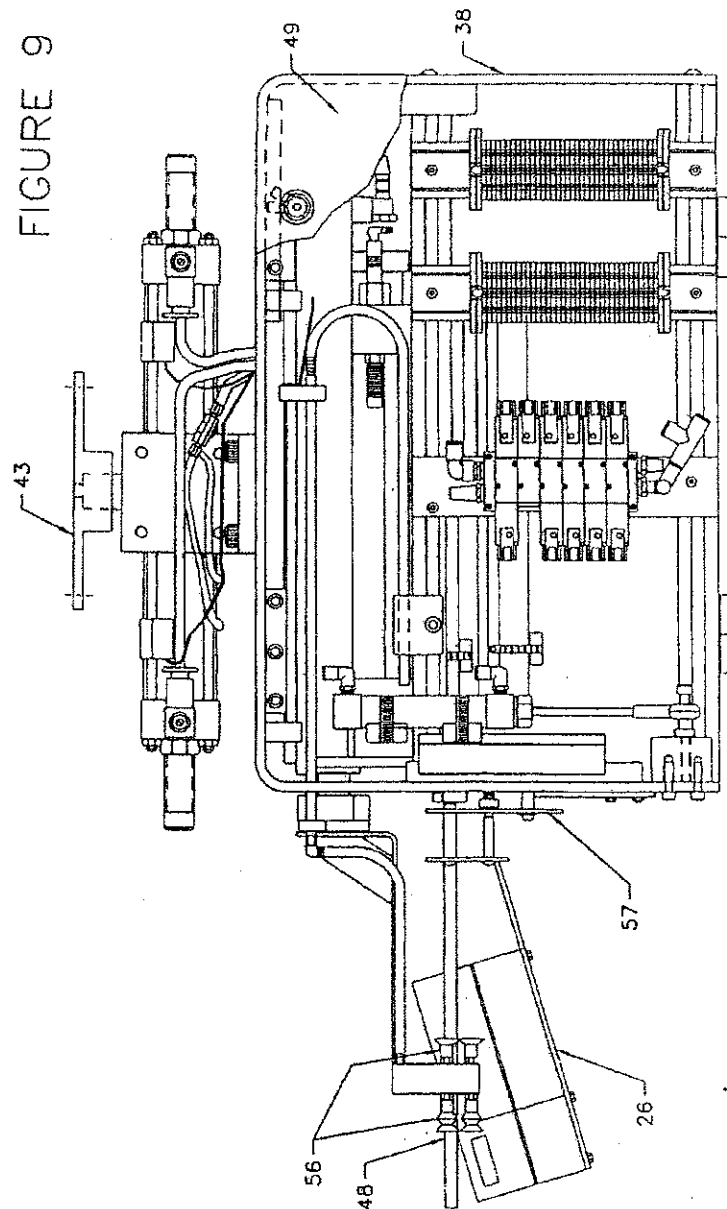
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FIGURE 9



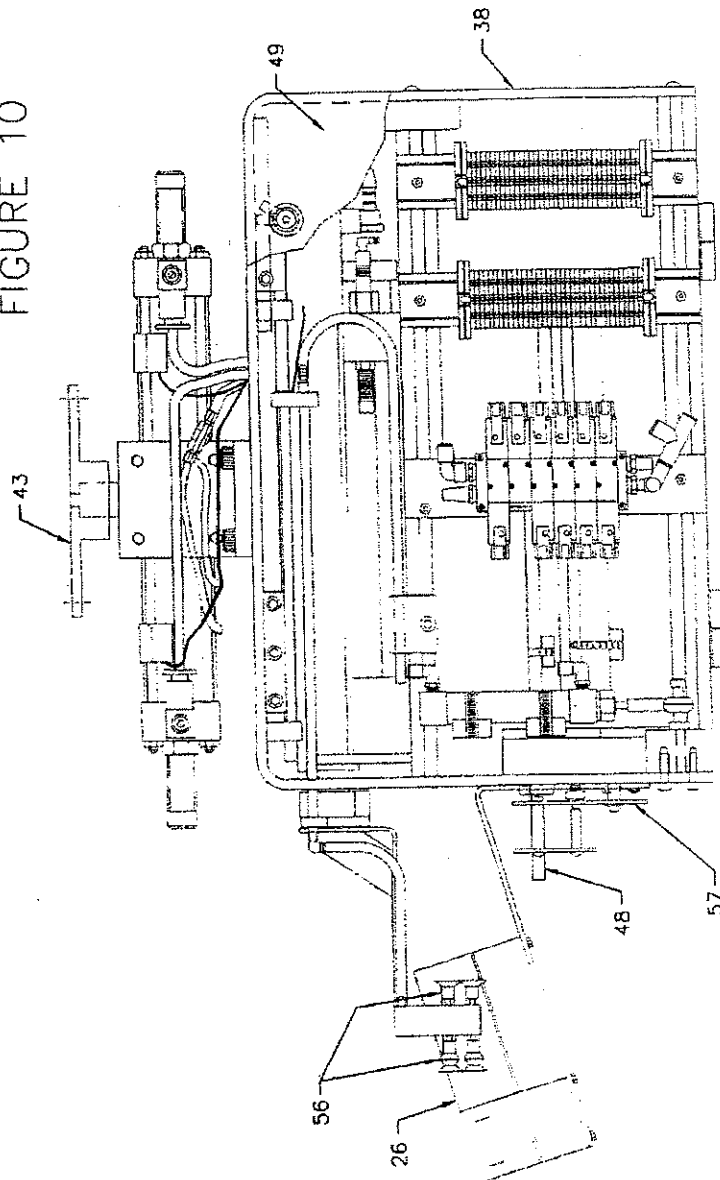
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FIGURE 10



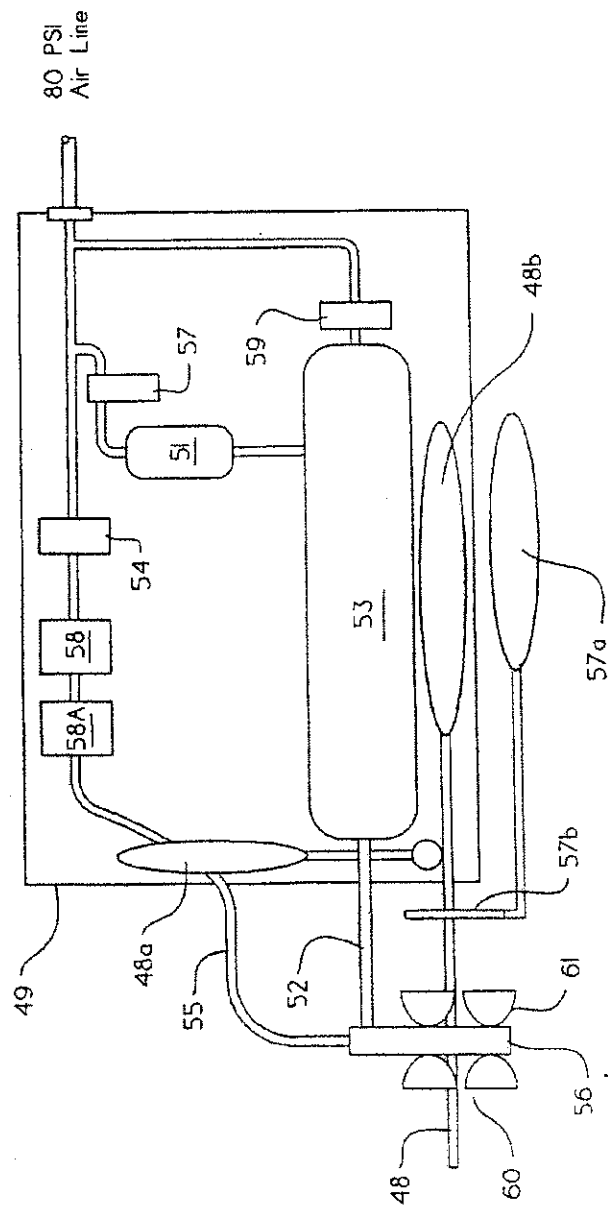
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Figure 11



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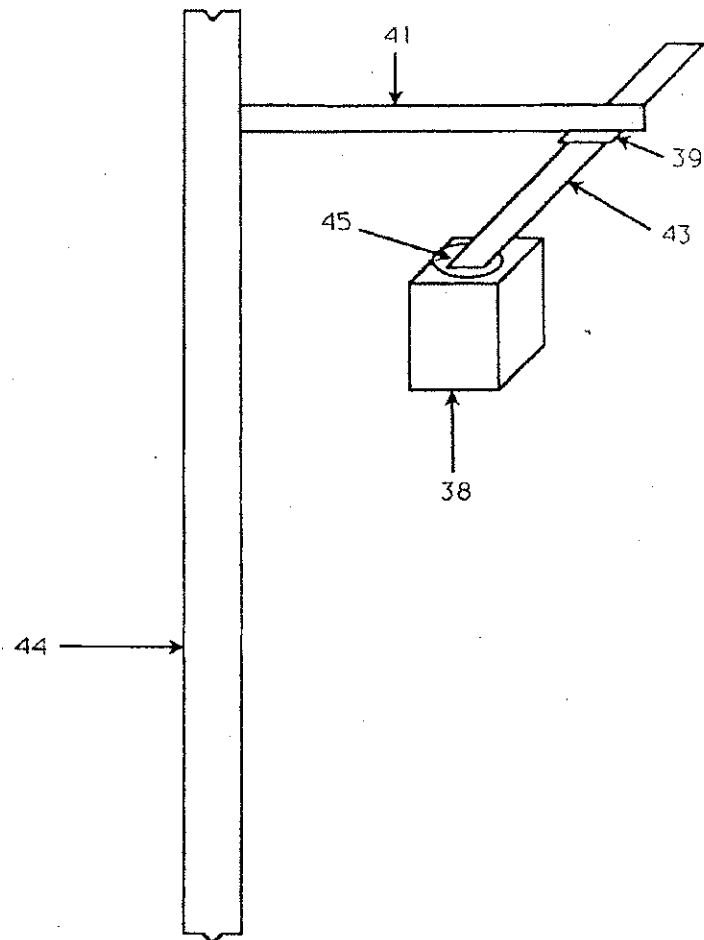


Figure 12

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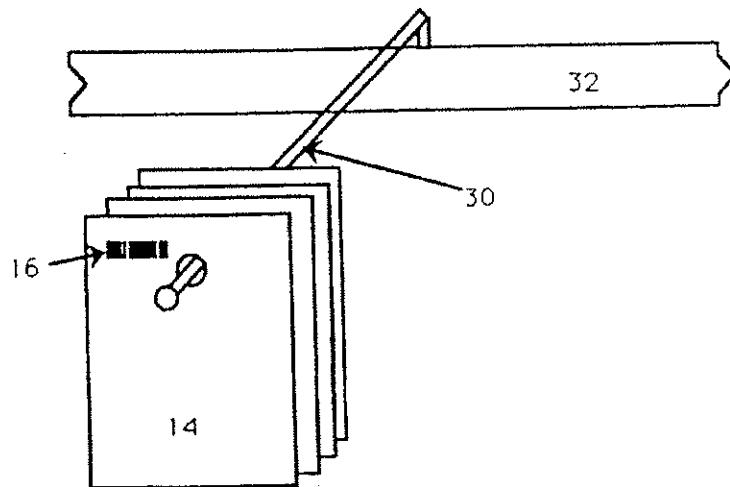


Figure 13

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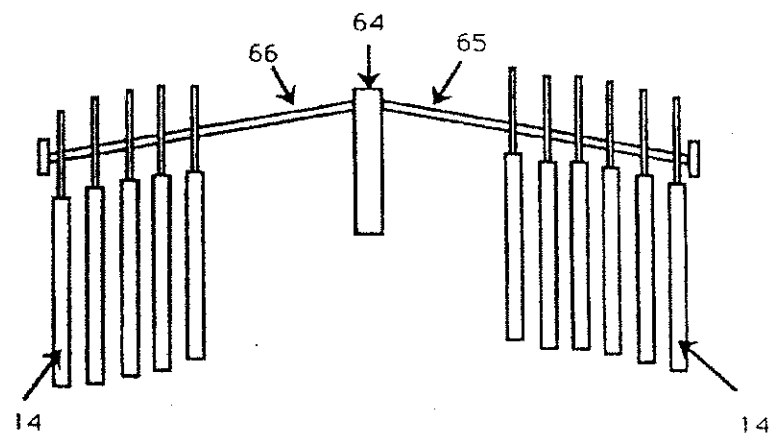


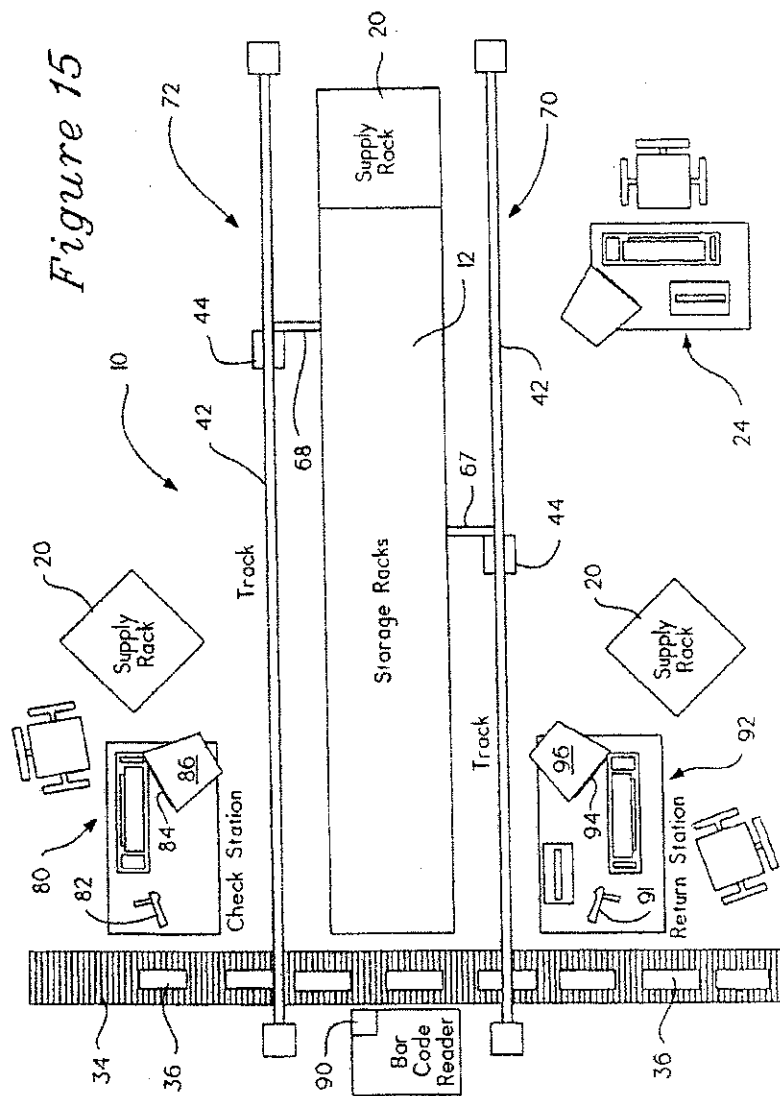
Figure 14

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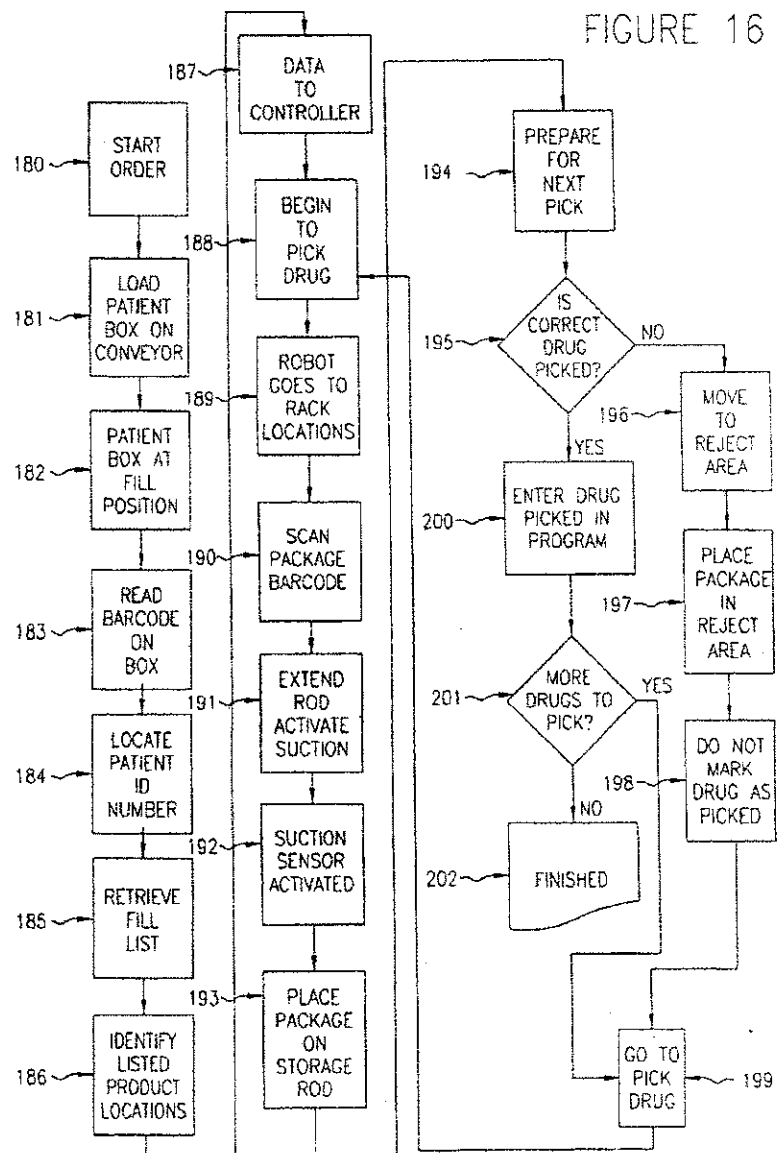


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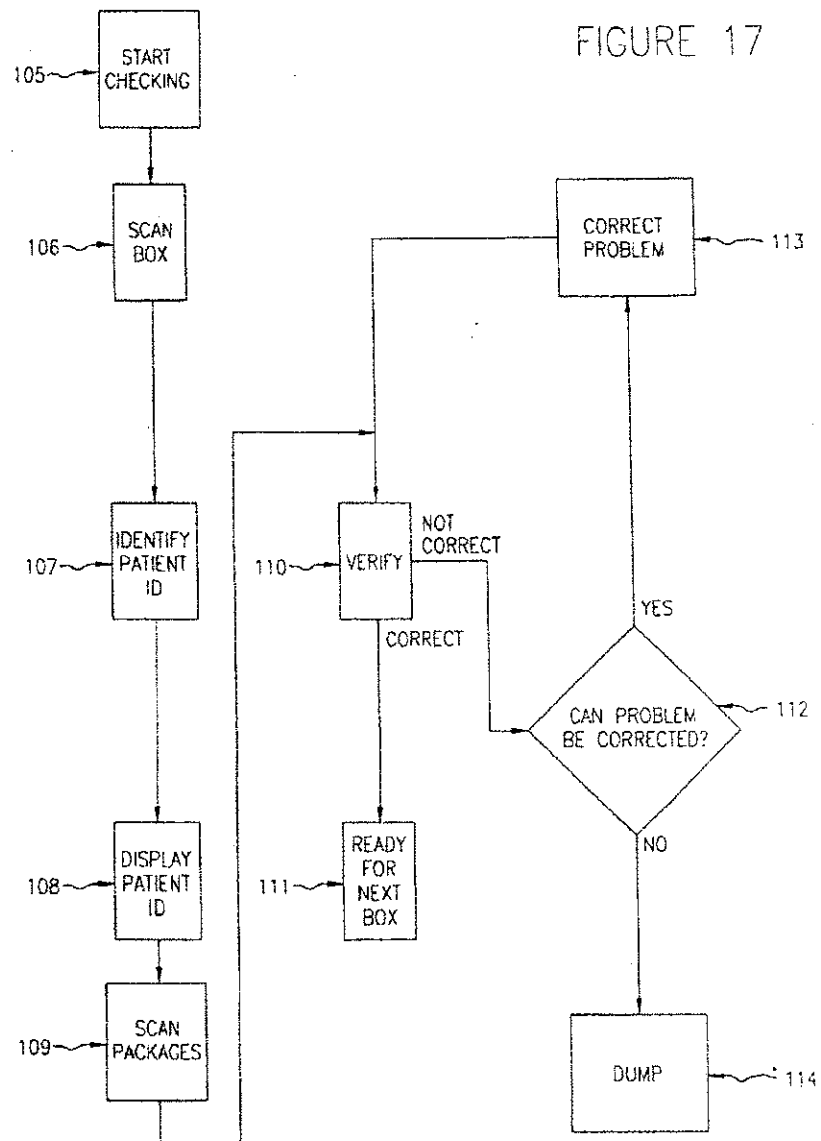
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FIGURE 17

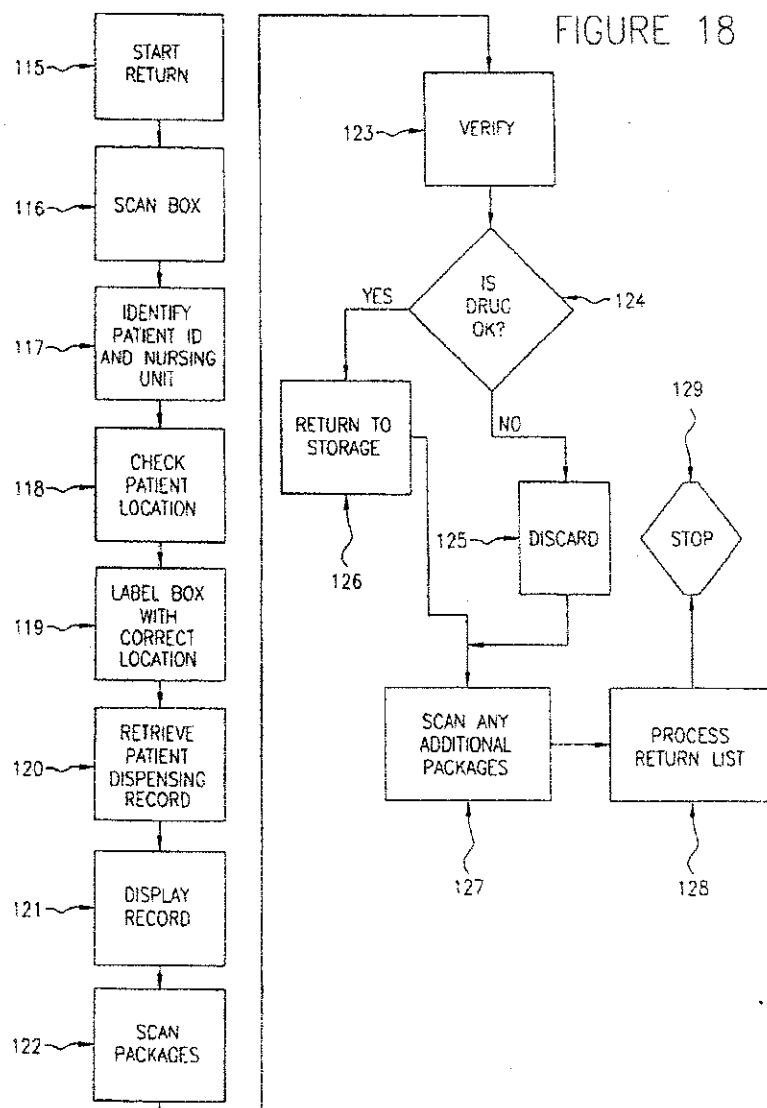


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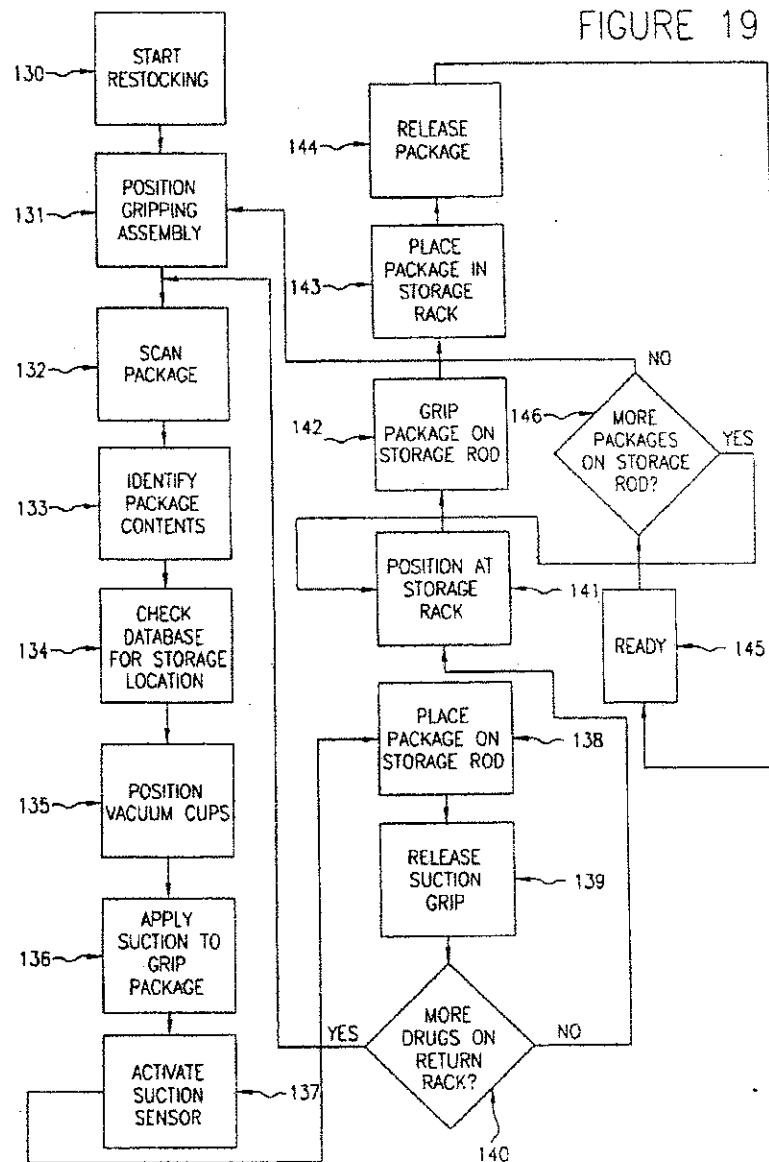


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1 **AUTOMATED SYSTEM FOR SELECTING AND DELIVERING PACKAGES FROM A STORAGE AREA**

Related Application

This application is a division of Ser. No. 08/295,495 filed Aug. 25, 1994, now U.S. Pat. No. 5,468,110 which is a continuation of Ser. No. 07/871,832, filed Apr. 21, 1992, now abandoned which is a continuation-in-part of our U.S. patent application Ser. No. 07/469,217 filed Jan. 24, 1990, now abandoned.

2 **FIELD OF THE INVENTION**

The present invention relates to an automated system for selecting stored articles. More specifically, the present invention relates to an automated system for filling prescriptions and restocking medicines in a pharmacy.

BACKGROUND OF THE INVENTION

Many industries store products or parts in a storeroom or storage area and repeatedly select some of the stored items to fill orders or for other uses. Such items may range from small electronic components used by a manufacturer of electronic devices to automotive parts, which vary in size, used by service departments of automobile dealerships. Usually one or more people are employed to retrieve the requested items and to restock new and returned items. These individuals may also be required to confirm that the requested items are compatible with one another and with previously supplied items. If the supplied items are to be billed to a customer or charged to particular internal accounts, the list of items is first written by the requester, and rewritten or entered into a computer database by the storeroom attendant to create an invoice, supply list or other document. In some instances, further generations of the list are made by installers, users or billing clerks. Such methods have built-in opportunities for mistakes every time a list is rewritten and are less efficient than automated systems. Moreover, as labor costs rise and the size of inventory needed to be stored expands, the conventional storeroom and parts department become more and more expensive.

Some businesses have attempted to control costs by limiting inventory through standardization of parts. But such limits are not possible or desirable in some industries, particularly in a hospital pharmacy.

Currently, in large hospital environments, doctors visit patients in nursing units and write out medication orders for each patient. A patient is typically placed on a certain medication which may require multiple doses of medication be administered over a period of a day. Some medications are administered at certain times of the day and possibly at intervals of several hours. Patients may also request certain medications on an elective basis for disorders such as headaches. These requests are included in the doctor's order that is sent from the nursing unit to the central pharmacy of the hospital.

Once an order is received by the pharmacy, it is checked by registered pharmacists and input into the pharmacy information system. These orders reflect not only orders that are added to a particular patient's treatment, but changes in the medication treatment. The pharmacy information system combines this information with the patient's existing medication schedule and develops a patient medication profile. A fill list is generated from that profile. The fill list is a list of all the medications that must be distributed to all patients for

the day. This information is sent to the pharmacy printer where a hard copy is generated. Frequently, that hard copy or a copy thereof is sent to the billing department so that the medication can be charged to the patient or his insurer.

At this point, the drugs for a particular patient are hand-picked by either a pharmacist or a pharmacy technician and placed in the particular patient's designated box. A registered pharmacist must then check the accuracy of the patient order before it leaves the pharmacy. Individual patient boxes are then loaded into a large cassette and delivered to the nursing unit.

Approximately 30% of the drugs dispensed each day are returned to the pharmacy unused. Since each drug is individually packaged, the drugs must be returned to the pharmacy stock. Patients are then credited for unused medication. This return and crediting process is a very time-consuming task and requires significant amount of pharmacy manpower.

In a typical large pharmacy, up to 35 pharmacists and pharmacy technicians are responsible for all aspects of the unit dose dispensing task. Because this process is done manually, a certain amount of error occurs. Studies have estimated that a half-percent error rate is typical in a large hospital. Since a hospital may dispense over 6,000 doses each day, this error rate leads to a significant number of missed or incorrect doses.

Several companies have tried to automate this process through various approaches to the problem. Meditrol utilizes a vending machine approach to dispense the unit dose medications. Each nursing unit must have its own stock of prescription drugs. Nurses key in a patient ID and the drugs for that patient are then dispensed from the vending machine. This system is very expensive because of the necessity of purchasing a machine for each nursing unit. Also, restocking each machine is a very time-consuming task. Implementation of this system requires a complete modification of the current drug dispensing process which many hospitals are reticent to undertake. The system claims no labor-saving advantages from its implementation. This system is covered under U.S. Pat. No. 3,917,045 titled "Drug Dispensing Apparatus" and dated Nov. 11, 1975.

Baxter Travenol offers a dispensing system from Samsung, a Korean company, which dispenses bulk solids into a package which is dispensed to the pharmacist. This system only dispenses the 200 most frequently used solids. A typical hospital pharmacy can contain over 1,500 different medications, many in liquid, syringe or bottle form. These medications cannot be automatically dispensed by this system, but must be manually selected by the pharmacist.

Neither system allows the dispensed medications to be automatically returned to the storage area.

There is a need for an automated system which is able to dispense all dosage forms currently contained in a hospital pharmacy. Medicines should be automatically dispensed by the system per a patient order and placed in individual patient medication boxes for a pharmacist to check. Each drug and each patient box should be individually bar coded so that the accuracy of the dispensing process can be automatically checked by the system. Once drugs are returned to the pharmacy, the system should automatically return each drug to its proper location in inventory and credit the patient's account for the return. One system should also keep a running inventory and notify the user whenever inventory of a particular item drops below a preset level and whether the shelf life of an item has passed. With such a system, a hospital can recognize significant labor savings, as

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well as savings based on improved accuracy in the dispensing function and better tracking of inventory and expired medications.

SUMMARY OF THE INVENTION

We provide an automated method and apparatus for selecting and restocking stored items, which is particularly useful for filling patient medication orders in a hospital pharmacy. The stored items must be packaged to be held in a storage rack. Preferably, each package contains a bar code corresponding to the package contents. The items are arranged in a main storage rack so that like items are in the same location and a predetermined location is provided for every item.

We prefer to provide a second rack or a designated portion of the main storage rack for receipt of new or returned items to be restocked. Such items can be randomly placed on this supply station for transmittal to their respective predetermined locations on the storage rack.

We also provide a means for picking items from and placing items in the storage rack and the supply station. The picking means preferably is comprised of a gripper assembly mounted on a transport vehicle which moves along a track or other controlled route. The gripper assembly preferably has a movable rod or other carrier for holding selected items, at least one vacuum head and associated controls for gripping and moving selected items. We prefer to provide a bar code reader for reading item packages.

We also prefer to provide a conveyor on which boxes, patient medication trays or drawers can be placed. The conveyor is positioned so that the picking means can place selected items into appropriate containers on the conveyor.

We provide a processing unit with associated memory and data entry peripherals. This computer system receives the list of requested items, directs the picking means, checks the items selected and prepares reports. Data can be entered manually through a keyboard or bar code reader or electronically through an RS 232 port. Reports may be printed, displayed on a console or transmitted to a memory or another computer for later use.

Other details and advantages of our method and apparatus will become apparent from the description of the preferred embodiments shown in the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings, the preferred embodiments of the invention and preferred methods of practicing the invention are illustrated in which:

FIG. 1 is a schematic representation of our present preferred system.

FIG. 2 is a side view of a present preferred package.

FIG. 3 is a perspective view of one present preferred storage rack.

FIG. 4 is a perspective view of a portion of a second preferred storage rack.

FIG. 5 is a perspective view of a portion of a third preferred storage rack.

FIG. 6 is a schematic representation showing the storage rack, conveyor and movable support structure which holds a gripper assembly.

FIG. 7 is a schematic view of a present preferred gripper assembly.

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FIG. 8 is a front view of a present preferred gripper assembly.

FIG. 9 is a side view of the gripper assembly of FIG. 7 with the storing rod in a raised and extended position.

FIG. 10 is a side view of the gripper assembly of FIG. 8 with the storing rod in a lowered and partially retracted position.

FIG. 11 is a diagram showing a preferred vacuum and pressure line for the gripper assembly.

FIG. 12 is a schematic representation of the gripper assembly mounted on a vehicle.

FIG. 13 is a perspective view of a rod with packages thereon connected to a support bar.

FIG. 14 is a schematic representation of a side view of a first rod and a second rod and having packages thereon attached to a portion of the support bar.

FIG. 15 is a schematic overhead view of an alternative system for filling an order.

FIG. 16 is a flowchart of the filling process.

FIG. 17 is a flowchart of the check process.

FIG. 18 is a flowchart of the return process.

FIG. 19 is a flowchart of the restocking process.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings wherein like reference numerals refer to similar or identical parts throughout the several views, and more specifically to FIG. 1 thereof, there is shown a schematic representation of a present preferred system 10 for filling orders, such as prescriptions for patients. The system 10 contains storage racks 12 for handling packages. We prefer to provide at least two storage racks 12 and arrange them parallel to one another. Various storage rack designs can be used and certain present preferred storage racks are shown in FIGS. 3, 4 and 5. In our system, each package preferably contains only one product, although the product may consist of two or more related items, such as nut and bolt. When our system is installed in a hospital pharmacy, each package preferably contains a single dose of medicine.

A present preferred package 14 is illustrated in FIG. 2. Although the package could be a blister card or box, we prefer to use a clear plastic bag having a hole 15 to permit the package to be hung on a rod 30, 48, 65 or 66 shown in FIGS. 3, 6 and 14. Each package preferably has a bar code 16 and a written description 17, which identify the contents of the package. A white area 17a can be created on the clear plastic bag over which the written description 17 can be printed, stamped or even handwritten. The bar code and the written description may include not only the name of the product, but also its quantity, weight, instructions for use and expiration date. We also prefer to position the bar code and label on the package so that there is a large unmarked area 62 through which one can see the contents of the package. FIG. 2 represents a clear plastic bag for a unit dose of medicine. We can use a bag having a perforation line for easy opening or a reclosable bag having an interlocking rib type seal. The perforation line or rib seal is located along line 13. This type of bag is useful in a hospital pharmacy which buys medicines in large or bulk quantities and must repack the drugs in individual dose packages. Package 14 can be any desired size. We have used a rectangular package having dimensions indicated by arrows A, B, C and D, wherein A is 3.5 inches, B is 1.0 inch, C is 3.0 inches and

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D is 0.1875 inches. Alternatively, the package 14 can have A equal 5.0 inches, B equal 1.25 inches, C equal 5.0 inches and D equal 0.1875 inches.

An individual dose of medicine can be manually fed into an automated packaging system 98, as shown in FIG. 1, which automatically seals the package and prints a bar code and typewritten label directly on the package. In a preferred embodiment, we utilize the H-100™ packaging system as manufactured by Automated Packaging Systems of Twinsburg, Ohio. With the addition of the Accu-Print™ 100 Programmable In-Line Direct Transfer Imprinter, also manufactured by Automated Packaging Systems, a bar code can be printed directly on the medicine package.

A storage rack 12, which may also be used for a supply station, is shown in FIG. 3. This rack is configured to hold packages of the type illustrated in FIG. 2. The rack has a rectangular frame 28, having an open front and back. Running across the back are a plurality of back rod supports 32 from which the rods 30 extend. The frame 28 with rod supports 32 forms an X, Y coordinate system with each rod 30 and medicine packages 14 therein having a unique X, Y coordinate. Packages are placed in the storage rack so that each product is located at a known X, Y coordinate. Since every product is in a known X, Y location, it is possible to direct an automatic picking means to any product location to select a desired item. The packages are segregated within the storage rack so that all packages in any given location have the same contents.

Although we prefer to use racks in which packages are hung on rods, other types of racks can be used for storage racks and supply stations in our system. In FIG. 4, we show the upper portion of a rack having a rectangular frame 21 with an open front and closed back 23. Attached to the back 23 are sets of brackets 25 positioned to hold packages 27. To be held securely in this rack, such packages must be fairly rigid. Blister cards and boxes can be used. If desired, a hole 15 could be provided in the packages to permit them to be carried on a rod.

A top portion of another suitable rack having a rectangular frame 21, open front and closed back 23 is shown in FIG. 5. This rack has a set of shelves 29, which may be inclined toward back 23. A set of dividers 31 separates groups of packages 27.

The racks of FIGS. 3, 4 and 5 have two important common features. First, the packages are held in locations having known X, Y coordinates. Those coordinates could be single X, Y values as may correspond to the position of the package holes 15 or a group of X, Y values defining an entire package. Second, there is sufficient clearance between packages to allow automated picking means to select, grab and replace individual packages.

Referring now to FIGS. 1 and 6, we provide storage racks 12 on either side of a track 42 over which a vehicle 44 may travel. The vehicle may be column-shaped as in FIG. 6. Many types of drive systems could be used to propel the vehicle. For example, one could provide a motor indicated by block 47 to propel wheels (not shown) at the base of the vehicle. Alternatively, one may use a chain or cable running through the track 42 to pull the vehicle to any desired location. Whatever drive system is used should be capable of moving the vehicle to positions along the track which correspond to the X coordinates of the packages within the rack. Thus, computer 24, which controls the drive system, can direct the vehicle 44 to a location in front of the package or packages to be selected.

Packages are selected by a picking means 38, preferably of the type illustrated in FIGS. 7 through 10. The picking

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means is mounted on column-shaped vehicle 44 in a manner to allow controlled vertical movement along that column. In this manner, the picking means 38 can be positioned at locations along column 44 which correspond to the Y coordinates of packages to be selected. The picking means 38 is controlled by a computer 24, or local area network of computers, having a database. The database has the order to be filled and a record of the predetermined locations 18 of each different product in the storage rack 12. The computer 24 guides the picking means 38 based on information contained in the database, such that the picking means 38 picks a package 14 according to the order to be filled. The picking means 38 can also include means, such as a bar code reader 26 as shown in FIG. 7, for determining the identity 16 of a package 14 in the storage rack 12 or in a supply rack 20 and providing its identity 16 to the computer 24. The computer 24 guides the picking means 38 to select the desired packages and deliver them to a desired location. In the system of FIGS. 1 and 6, the packages are delivered to containers 36 located on conveyor 34. When the system is installed in a hospital pharmacy, the containers 36 are individual patient boxes in which the patient's medication is delivered from the pharmacy to the appropriate floor or nurses' station. The patient boxes preferably are bar coded with a patient identification code. After a patient's prescription is filled and the patient box 36 has all the medicine packages called for in the prescription, a conveyor belt 34 moves the patient box 36 to a check station 80. An operator uses the check station bar code reader 82 to scan the bar code label on the filled patient box 36, see FIG. 15. The patient identification number is taken from the inputted bar code and the prescription of the patient is displayed on the check station screen 84 of the check station console 86 connected to the computer or network of computers 24. The operator then scans individual medicine package bar codes in the patient box 36. The identity of the medicine packages 14 in the patient box 36 is automatically checked for correctness with respect to the patient list on the station screen 84. If the medicine packages 14 in the box 36 are correct, then the patient box is allowed to continue on towards the ultimate destination and the next filled patient box 36 is then checked. If the medicine packages 14 in the patient box 36 are not correct, then it is determined whether the error, whatever that may be, can be corrected. If the correction can be made, then the record on the check station screen 84 is corrected and the procedure for verifying correctness is then repeated. If the problem cannot be corrected, then the patient box 36 can be manually filled or resubmitted to be filled with missing doses by the system and the computer is notified that the patient's prescription has not yet been filled.

In the event that a patient does not take all of the medicine which has been prescribed, unused medicine is returned to the hospital pharmacy in the patient box 36. Typically, patient boxes are transferred in a carrier which contains several patient boxes. This carrier is received at a return station 92. The patient box 36 is first removed from the carrier returned from a nursing unit. An operator uses the return station bar code scanner 91 to scan the bar code on the patient box 36. The nursing unit number and the patient identification number is then parsed from the inputted bar code of the patient box 36. The database is then accessed and the patient dispensing record is retrieved. On the return screen 94, there is displayed for a particular patient at the operator console 96, a list of the medicines ordered and dispensed to the patient. The operator of the return station 92 then scans the identity 16 of the medicine in the patient's box 36 with the return station bar code scanner 91. The

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medicine packages 14 that are found thereon are verified as being dispensed to the patients. The expiration date of the medicine in the medicine package 14 is then determined. If the expiration date of a medicine in the medicine package 14 has passed, then the medicine package is discarded. If the expiration date has not passed, then the returned medicine package 14 is placed in the supply rack 20. If there is more medicine to be returned, the process is then repeated. If there is no more medicine in the patient box 36 to return, then the return station console 96 is checked to verify the correctness of the medicine returned. If the screen is correct, then the return record is accepted and the database is updated. If the screen 94 is incorrect, then the screen is corrected to correspond to the returned medicine packages 14 and the patient box 36. In this manner, the system will have developed a record of all medication given to each patient. That record can be transferred to a hospital billing system and used for billing purposes. The data can also be input into an inventory monitoring system and used to generate reports or orders for new supplies.

We prefer to provide supply racks 20 which serve as a holding area for returned and new products. These racks are comparable to storage racks 12 and are accessed by the picking means 38 in the same manner. However, products are randomly placed in the supply racks either manually or by the picking means. The supply racks 20 are shown in FIG. 1 at a position where they are accessible to the picking means. However, we prefer that the supply rack be movable. Then it could be moved to other convenient locations, such as near packaging system 98 for refilling.

When packages 14 are to be restocked onto the storage racks 12, the supply rack 20 is placed in a predetermined position alongside the storage racks 12. By being placed in a predetermined position, the X and Y coordinates at which packages may have been placed in return racks 20 are known to the computer 24. Picking means 38 is then positioned for a given package in the return rack. The bar code reader 26 on the end of picking means 38 then scans the identity 16 of the package 14 that is about to be picked. The process of picking the returned packages 14 is the same as occurs with respect to the process of obtaining packages 14 from the storage rack 12. The only difference is that the order of the packages 14 and their identity as they are picked is saved in the computer 24. When the picking means is then moved to the storage racks 12 the computer knows the identity of the respective medicine package 14 on the picking means 38, which is about to be placed back onto the storage racks 12.

The picking means 38 includes at least one gripper assembly illustrated in FIGS. 7 through 12. As shown in FIG. 12, we prefer to provide a support bracket 41 extending from column 44. This bracket can move along column 44 in a vertical direction. A third actuator 43 is attached to bracket 41. Mounting 39 permits movement along rod 41 and movement at bar 43 in a direction normal to rod 41. A picking means 38, which preferably is the gripper assembly of FIGS. 7 through 10, is mounted to actuator 43 through actuator 45, which permits a 180-degree rotation of the gripper assembly. Actuator 43 permits horizontal movement of picking means 38 in the Z direction.

The gripper assembly is preferably comprised of a housing 49, as shown in FIG. 7 having means for storing medicine packages 14, such as a storing rod 48. Assembly 38 also contains means 50 for obtaining a package 14. The obtaining means 50 is slidably attached to the housing 49 such that it can move in a Z direction, which is perpendicular to the X, Y directions, to pick a package 14 from a support rod 30 in the storage rack 12 or supply rack 20. Identifying

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means, for example, the bar code reader 26 shown in FIG. 8, is mounted on housing 49 such that it can identify a package 14 to be picked by the obtaining means 50. The obtaining means 50 preferably includes means for producing a suction, such as a vacuum generator 58 controlled by a vacuum sensor 58a which draws a vacuum through vacuum line 55 and vacuum valve 54. The obtaining means 50 also preferably includes an extension rod 52 in fluidic communication with a pneumatic in/out cylinder 53 and associated valve 59, as shown in FIGS. 8 and 11. The extension rod 52 is slidably attached with respect to the Y and Z directions to the housing 49. A suction is maintained through the vacuum lines 55 when the vacuum valve 54 is activated to supply air to vacuum generator 48. The obtaining means 50 also can include a suction head 56 connected to the extension rod 52 through which a package is picked with suction. The vacuum sensor 58a will sense when a package is properly positioned on the suction head 56, for example, by detecting air flow therethrough. The suction head 56 and carried package are then moved to the storing means, such as the storing rod 48, to deposit the package thereon. Preferably, the storing means is a storing rod 48 which extends from the housing 49 such that the suction head 56 and the extension rod 52 can deposit a package 14 thereon. The obtaining means 49 is also composed of a cylinder 48A which allows an assembly of both holding rod 48 and pusher plate 57 to move in the Y direction. The holding rod 48 is also attached to a cylinder 48B which allows the storage rod to retract and extend in reference to the obtaining means. The pusher plate 57B is also attached to a cylinder 57A which allows the plate to move in the positive Z direction. This action is necessary to push drugs off of the storage bar 48 during the dump process.

The extension rod 52 can move in the Y and Z directions to place a picked package on the storing rod 48 under the action of up/down cylinder 51 and in/out cylinder 53. Valve 57 activates cylinder 51 to move both the cylinder 53 and the extension rod 52 in the Y direction. Valve 59 activates cylinder 53 to move the extension rod in the Z direction. Valve 54 provides air to the vacuum generator 58 to suction in head 56 sufficient to pick a package from a rod 30 of the support structure 28 and then hold it to the suction head 56. The suction head 56 preferably has two faces 60 and 61 through which suction can be drawn. One face 60 is capable of picking a package from a rod 30 of the storage rack and the other face 61 is capable of picking a package from a storing rod 48 of the picking means 38. As shown in FIG. 2, each package preferably has a face 62. The packages are held by the storing rod 48 and the rods 30 of the support structure 38 such that the face 62 of each package is parallel to the Y axis. The outside face 60 is utilized when a package 14 is being removed from a rod 30 in the supply rack, and the inside face 61 is utilized when a package is being removed from the storing rod 48 of the picking means 38.

In an alternative embodiment, the rods 30 extend from the double rod support bar 64 n sets of two as shown in FIG. 14. A first rod 65 and a second rod 66 of each set point essentially in the Z direction, but approximately 180 degrees apart from each other. This embodiment shown in FIG. 15 includes a first tooling support structure 70, a second tooling support structure 72, a first end of arm tooling 67 and a second end of arm tooling 68 that picks the packages 14. Each tooling support structure has at least one column type vehicle 44 and at least one track 42 to support the column 44. Column 44 moves along the respective tracks 42 to pick a given package 14 from a corresponding support rod 30, or restock a support rod 30 with an associated package 14.

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In the operation of the preferred embodiment in a hospital, doctors visit patients in nursing units and write out medication orders for each patient. A patient is typically placed on a certain medication treatment which requires multiple doses of medication over a period of a day. Some medications are administered at certain times of the day and possibly at intervals of several hours. Patients may also request certain medications on an elective basis for disorders such as headaches. These requests are included in the doctor's order that is sent from the nursing unit to the central pharmacy of the hospital. Once an order is received by the pharmacy, it is checked by registered pharmacists and input into the pharmacy information system. These orders reflect not only orders that are added to a particular patient's treatment, but changes in the medication treatment. The pharmacy information system combines this information with the patient's existing medication schedule and develops a patient medication profile. A fill list is generated from that profile. The fill list is a list of all the medications that must be distributed to all patients for the day. This information is sent to the pharmacy printer where a hard copy is generated.

Means for communication between the pharmacy information system and the present system exist by either tapping the serial data print stream of the pharmacy information system or by a direct bi-directional communication link. The relevant information concerning the patient including drug type, dosage and frequency is placed in the database of the system. The database contains information about which drugs are to be dispensed that day to the patient and all drugs that have been dispensed in the past to the patient. Information from the pharmacy information system is received on an ongoing basis throughout the day. New information can be entered into the database at any time. In addition to the fill list, new orders and patient admittance, discharge and transfer information are received and stored.

FIG. 16 is a flowchart with respect to the processing of a patient prescription. A similar method would be followed for retrieving other stored products. The software for processing an order is started as indicated by box 180. Then the steps indicated by boxes 181 thru 202 are followed. Before a box is loaded onto the conveyors, the operator scans the location barcode and the patient barcode on the patient box. The system then checks its database to ensure that that patient is still at that location. If a new patient has been transferred or admitted to that location, the system automatically generates a barcode label with that patient's identification number on it. This label is then manually applied to the patient box and the box is placed on the conveyor. If no patient is registered in the room, the box is placed aside and the operator proceeds with the next patient box to be filled. When the turn comes for the patient box 36 to be filled, it is shuttled into a position on the conveyor 34 such that the gripper assembly 38 can communicate with the box 36 as shown in FIG. 1. A stationary bar code reader 90 reads the bar code on the patient box 36. The patient identification number is then parsed from the bar code input. This causes the fill list for that particular patient to be retrieved from the database as indicated in box 185. The fill list is converted to data consisting of locations and number of picks. At box 187 the data is then downloaded to a robot controller or gantry control program in order for the computer 24 to control the end of arm tooling 38 such that it knows what packages 14 to obtain and place in the patient box 36.

The system is now ready to pick the drugs 188. First, the column-type vehicle 44 goes to the rack where the drug to be selected is stored and stops at the X coordinate of that drug package. The picking means 38 then moves along the

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column 44 to the Y coordinate of the medicine package to be picked. It is also turned to the proper storage rack 12 which has the desired package 14. These actions may also be performed simultaneously by the system 189.

When the end of gripper assembly 38 is properly positioned, the bar code reader 26 reads 190 the identity 16 on the medicine package 14 in order to confirm that it is the proper medicine package to be picked with respect to the patient's prescription. After such confirmation the suction rod 52 extends in the Z direction by pneumatic cylinder 53 such that the outside suction face 60 contacts the package face 62. Valve 54 activates a suction through the air lines 55 such that a suction drawn through the suction face 60 grabs the medicine package 14 sensor 58a detects when the contact is proper between the suction face 60 and the medicine package 14, as indicated at box 192 of FIG. 16. Then the extension rod 52 retracts from the rod 30 of the support structure 28, pulling the medicine package 14 with it. Once the medicine package 14 is clear of the rod 30, the extension rod 52 positions the medicine package 14 that it has obtained, upon the storing rod 48 as indicated by box 193.

The system now prepares for the next pick. This operation is indicated by box 194 includes several actions. Once the package 14 is on the storage rod 48, the vacuum valve 54 terminates the suction and the medicine package is released from the suction face 60. The vacuum valve 57 then activates the cylinder 51 such that the extension rod 52 (and cylinder 53) are moved in the Y direction so the bottom of the suction head 56 is above the package 14 on the storing rod 48. The extension rod is then moved forward in the Z direction and downward in the Y direction by the respective valves and cylinders to clear the package and position the suction head 56 for the next pick. In an alternative embodiment the storage rod 48 is moved down rather than moving suction head up 56 to provide clearance between them when the suction head moves in a Z direction. The computer 24 then notes that the medicine package 14 with the appropriate medicine has been picked.

The final series of operations indicated by boxes 195 thru 202 involves a comparison of the drug identified by the reader as having been picked with the list of drugs to be selected. If an incorrect drug was selected the gripper assembly moves to a reject area, places the incorrect drug there, removes that drug from the list of items selected and is ready to pick more drugs. If the correct drug was selected the system records that fact and is ready to pick more drugs. The process is repeated for all the medicine identified in the patient's prescription until all of the medicine packages 14 needed have been picked.

The gripper assembly containing all desired packages then positions itself so that it is over the patient box 36. The gripper assembly 38 then positions the outside suction face 60 behind the medicine packages on the storing rod 48 that have been collected. Packages can be dropped into the patient box by retracting rod 48 by actuating cylinder 48A to the position shown in FIG. 10. The storage rod 48 is then moved into the negative Z direction so that the suction face no longer holds the packages in place. The cylinder 48B then causes the storage rod 48 to be retracted which will cause the drugs to be dumped into the box.

Alternatively, the suction head may be stroked forward in the Z direction so that all packages 14 are pushed off the storing rod 48 into the patient box 36. Movement of the suction head is accomplished by the vacuum system. Vacuum valve 57 activates the cylinder 51 to retract in the

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positive Y direction such that the bottom of the suction head 56 is above the tops of the packages 14 on the storing rod 28. Then vacuum valve 59 activates cylinder 53 to retract the extension rod 52 in the negative Z direction such that the outer suction face 60 is behind all of the medicine packages 14 on the storing rod 48. Vacuum valve 57 is then activated such that the suction head 56 is dropped back down in the negative Y direction to be behind the packages 14. Finally, vacuum valve 59 is activated such that the extension rod 52 is extended in the positive Z direction and the front suction face 60 pushes all packages 14 off the storing rod 48 into the patient box 36.

In the event that the wrong medicine package 14 was scanned and is picked, or the medicine has expired, then picking means 38 will have placed those packages in a reject or return area, where the medicine package 14 can be disposed. A pharmacy technician will then manually sort the drugs in the reject area, removing expired drugs and placing the others in the supply rack in order that they might be returned to their correct location in the system. The process is then repeated for the next drug on the prescription list that has not yet been obtained.

The flow chart of FIG. 17 is the process of checking the selected packages which have been placed in a patient box. Such checking is performed at the check station. The process begins by calling up the check program indicated by box 105. The bar code on the patient box is scanned 106 and the patient number portion of the bar code is identified 107. The patient number is displayed 108 on the screen at the check station. Then the packages in the patient box are scanned 109. The identification of the packages is compared with the list of drugs that had been ordered for the patient in a verify step 110. If correct packages are in the box, the checking of the box is complete and the system is ready for the next box 111. If the packages in the box do not match the order the system determines if the problem can be corrected 112. If so, the correction is made 113 and the verify step is repeated. If not, the box is dumped 114 and the order is recorded as not filled or the box is resubmitted and the missing medications are filled by the system. For example, should the system determine that an item is missing it may either create a modified list and send the box on with a modified list or it may instruct the picking means to get the missing item.

The return process is shown in the flow chart of FIG. 18. The process starts 115 by calling up the return program. The patient box containing the returned items must be positioned so that the patient box can be scanned 116 for the patient identification number 117 and the nursing unit from which the box was returned. If the box has come from the proper nursing unit the system retrieves the patient dispensing record 120 and displays that record 121 for the operator. Next the packages are scanned 122. The system preferably verifies 123 that the scanned packages had been sent to the patient making the return. Next the system checks each package 124 to determine if the drug is useful or if it has expired, been recalled or otherwise should not be returned to the supply rack. If no, the package is discarded 125. If yes, the package is returned to the supply rack 126. If more drugs remain in the box the process is repeated 127. If no packages remain, the system may further process the list of returned packages 128 to modify the patient's record, update the system inventory log or display the list of returns for review by the operator.

The process of restocking returned or new packages to the storage rack is diagramed in FIG. 19. These packages are manually placed on a return or supply rack and the program for restocking is called up 130. The program causes the

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picking means to be positioned 131 so that the gripping assembly can pick packages from the return or supply rack. The bar code on the first package is scanned 132 and the portion of the scanned bar code which identifies the drug is found 133. The system then checks the database 134 for the location in the storage rack which has been designated for the identified product. The system extends the vacuum head 135 to engage the package. Suction is applied 136 and a suction sensor is checked. This should cause the package to be held by the gripper assembly which fact will be confirmed by the sensor 137. The gripper assembly positions the package 138 on the storage rod 48 in the gripper assembly. Then the suction is released and the gripper assembly is ready to place additional packages on the storage rod. If more packages remain on the return or supply rack 140, the process is repeated until all packages are on the storage rod or the storage rod is full. The gripper assembly is then moved to a position 141 in front of the storage rack to properly place the outermost package on the storage rod. That package is grasped 142 using back suction cups 61 (see FIG. 11). The extension rod 52 is retracted in the negative Z direction such that the inside suction face 61 is in contact with the medicine package 14. The sensing means 58 determines whether proper contact is made. Then the extension rod 52 is moved a predetermined distance in the positive Z direction 143 to place the medicine package over a rod 30 of support structure 28. Vacuum valve 54 is then deactivated 144 to stop suction, allowing the medicine package 14 on the suction face 61 to drop away therefrom. The extension rod 52 then moves in the negative Z direction towards the medicine packages 14 on the storing rod 48 to repeat the process. While it moves back to obtain another medicine package 14 the sensor 58 trips when contact is made. The process can be repeated 141 until there are no more medicine packages 14 on the storing rod 48. The computer 24 knows when to stop returning packages since it knew how many packages had been placed on the storing rod 48.

In the event that all drugs to be returned or restocked at a particular storage location are identical the process is some what different. Packages are picked from the supply rack in the method detailed above. The gripper assembly is then moved to a position in front of the storage rack to place the remaining packages on the storage rod. Cylinder 48A causes the assembly of storing rod 48 and pusher plate 57B to move in the negative Z direction. Storage rod 48 is co-linear with a rod 30 of support structure 28. Pusher plate 57B then moves in the positive Z direction pushing all remaining packages on storage rod 48 on to rod 30.

The restocking of the storage racks 12 can be carried out during the evening when packages are not being gathered to fill orders. Alternatively, restocking can be carried out simultaneously with picking if the system 10 has a pair of rods as shown in FIG. 14, a first end of arm tooling 67, second end of arm tooling 68 and a first tooling structure 70 and a second tooling structure 72 is utilized, as shown in FIG. 15. While, for instance, the first end of arm tooling 67 is picking medicine packages 14 to fill a patient's prescription the second end of arm tooling 68 can be restocking the second side of the storage area 12.

Although the invention has been described in detail in the foregoing embodiments for the purpose of illustration, it is to be understood that such detail is solely for that purpose and that variations can be made therein by those skilled in the art without departing from the spirit and scope of the invention except as it may be described by the following claims.

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We claim:

1. A system for selecting and delivering medicine packages from a holding means to fill orders comprising:

- a) holding means comprised of a frame having a plurality of support rods each support rod sized for holding a plurality of medicine packages, each rod associated with a given medicine and holding medicine packages with only the same medicine each support rod having a distinct X, Y coordinate location;
- b) means for picking medicine packages from the support rods in accordance with instructions received from a computer, said picking means being able to access the holding means; the picking means capable of holding a plurality of medicine packages which have been picked from the holding means;
- c) a computer having a database containing an X, Y coordinate location for all packages in the holding means, the computer able to receive orders for packages and able to direct the means for picking packages; and
- d) a supply structure having a plurality of supply support rods which extend from said structure to form an X, Y coordinate system, with each supply support rod and medicine package thereon having a unique X and Y coordinate, said picking means disposed to have access to said structure such that a given medicine package on an associated supply support rod can be picked by the picking means to fill a patient's prescription, or a given medicine package in the supply structure can be picked by the picking means to restock an associated rod in the holding means.

2. A system as described in claim 1 including a conveyor in communication with the picking means; and patient prescription boxes which are moved by the conveyor to the picking means such that the picking means provides the medicine packages it has picked to fill a given prescription to an associated box.

3. A system as described in claim 1 wherein the picking means includes at least one gripper that picks the medicine packages; and a tooling support structure having at least one column supporting the column such that the picking means moves along the column as the column moves along the row to pick a given medicine package hanging from a corresponding support rod, or restock a given medicine package on a corresponding support rod; and means for moving the column with respect to the row, said moving means controlled by the computer.

4. A system as described in claim 3 wherein the picking means is comprised of:

- a housing;
- means for storing a plurality of medicine packages attached to the housing;
- means for obtaining a medicine package, said obtaining means slidably attached to the housing such that it can move in a Z direction, which is perpendicular to the X and Y directions, to pick a medicine package from a support rod when the housing is adjacent to and aligned

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with a support rod, and can move in the Z direction to place a picked package on the storing means; and identifying means attached to the at least one gripper such that it can identify a package to be picked by the obtaining means, each of said packages having an identity disposed on them which can be read by the identifying means.

5. A system described in claim 4 wherein the identity of each package is a bar code, and the identifying means includes a bar code reader disposed on the obtaining means.

6. A system as claimed in claim 1 wherein the support rods extend from back rod supports within the frame in sets of two, with a first rod and a second rod on each set pointing essentially in a Z direction which is perpendicular to the X and Y directions, but approximately 180° apart from each other.

7. A system for selecting and delivering packages from a holding means to fill orders comprising:

- a) holding means comprised of a frame having a plurality of support rods for holding packages each support rod having a distinct X, Y coordinate location and holding a plurality of packages, all of those packages on each support rod having similar contents;

- b) picking means for picking packages from the support rods in accordance with instructions received from a computer, the picking means being able to access the holding means and having

- a housing;
- means for storing packages attached to the housing;
- means for producing a suction;

- a suction rod in fluid connection with the suction producing means, said suction rod slidably attached with respect to the Y and Z directions to the housing and maintaining a suction therethrough when the suction producing means is activated by which a medicine package is picked with suction; and

- means for sensing when a package is properly positioned such that the package rod is then moved to the storing means and deposits the package thereon.

8. A system as described in claim 7 wherein the storing means is a storing rod which extends from the housing such that the suction head and the suction rod can deposit a package thereon.

9. A system as described in claim 8 wherein the tooling includes valves and pneumatic cylinders for moving the suction rod in the Y and Z direction; and a vacuum pump for providing suction to the suction rod and support head sufficient to pick a package from a rod of the support structure and then hold it to the suction head.

10. A system as described in claim 9 wherein the suction head has two faces through which a suction can be drawn, each face capable of picking a package.

11. A system as described in claim 10 wherein the two faces are parallel to each other and are parallel to the x-axis, and wherein each package has a face and the package are held by the storing rod and the rods of the support structure such that the face of each package is parallel to the x-axis.

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FOREIGN/PCT APPLICATIONS***

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COUNTRY

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AUTOMATED SYSTEM FOR SELECTING AND DELIVERING PACKAGES FROM A STORAGE AREA

This is to certify that annexed hereto is a true copy from the records of the United States Patent and Trademark Office of the application which is identified above.

By authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS

Date: _____

Certifying Officer

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V. Williams
7-12-95

TITLE

AN AUTOMATED SYSTEM FOR SELECTING
AND DELIVERING PACKAGES FROM A STORAGE AREA

Related Application

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5 no. 5468110 which is a continuation of ~~Sn 07/371832~~ ^{Sn 08/295495 filed 8/25/94, now Pat} ~~now abandoned~~ which
~~this~~ is a continuation-in-part of our United States ^{now abandoned}
patent application Serial No. 07/469,217 filed January 24, 1990.

FIELD OF THE INVENTION

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The present invention relates to an automated system for selecting stored articles. More specifically, the present invention relates to an automated system for filling prescriptions and restocking medicines in a pharmacy.

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BACKGROUND OF THE INVENTION

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Many industries store products or parts in a storeroom or storage area and repeatedly select some of the stored items to fill orders or for other uses. Such items may range from small electronic components used by a manufacturer of electronic devices to automotive parts, which vary in size, used by service departments of automobile dealerships. Usually one or more people are employed to retrieve the requested items and to restock new and returned items. These individuals may also be

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required to confirm that the requested items are compatible with

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one another and with previously supplied items. If the supplied items are to be billed to a customer or charged to particular internal accounts, the list of items is first written by the requestor, and rewritten or entered into a computer database by the storeroom attendant to create an invoice, supply list or other document. In some instances, further generations of the list are made by installers, users or billing clerks. Such methods have built-in opportunities for mistakes every time a list is rewritten and are less efficient than automated systems. Moreover, as labor costs rise and the size of inventory needed to be stored expands, the conventional storeroom and parts department become more and more expensive.

Some businesses have attempted to control costs by limiting inventory through standardization of parts. But such limits are not possible or desirable in some industries, particularly in a hospital pharmacy.

Currently, in large hospital environments, doctors visit patients in nursing units and write out medication orders for each patient. A patient is typically placed on a certain medication which may require multiple doses of medication be administered over a period of a day. Some medications are administered at certain times of the day and possibly at intervals of several hours. Patients may also request certain medications on an elective basis for disorders such as headaches. These requests are included in the doctor's order that is sent from the nursing unit to the central pharmacy of the hospital.

Once an order is received by the pharmacy, it is checked by registered pharmacists and input into the pharmacy information system. These orders reflect not only orders that are added to a particular patient's treatment, but changes in the medication
5 treatment. The pharmacy information system combines this information with the patient's existing medication schedule and develops a patient medication profile. A fill list is generated from that profile. The fill list is a list of all the medications that must be distributed to all patients for the day.
10 This information is sent to the pharmacy printer where a hard copy is generated. Frequently, that hard copy or a copy thereof is sent to the billing department so that the medication can be charged to the patient or his insurer.

At this point, the drugs for a particular patient are
15 hand-picked by either a pharmacist or a pharmacy technician and placed in the particular patient's designated box. A registered pharmacist must then check the accuracy of the patient order before it leaves the pharmacy. Individual patient boxes are then loaded into a large cassette and delivered to the nursing unit.

20 Approximately 30% of the drugs dispensed each day are returned to the pharmacy unused. Since each drug is individually packaged, the drugs must be returned to the pharmacy stock. Patients are then credited for unused medication. This return and crediting process is a very time-consuming task and requires
25 significant amount of pharmacy manpower.

In a typical large pharmacy, up to 35 pharmacists and pharmacy technicians are responsible for all aspects of the unit dose dispensing task. Because this process is done manually, a certain amount of error occurs. Studies have estimated that a half-percent error rate is typical in a large hospital. Since a hospital may dispense over 6,000 doses each day, this error rate leads to a significant number of missed or incorrect doses.

Several companies have tried to automate this process through various approaches to the problem. Meditrol utilizes a vending machine approach to dispense the unit dose medications. Each nursing unit must have its own stock of prescription drugs. Nurses key in a patient ID and the drugs for that patient are then dispensed from the vending machine. This system is very expensive because of the necessity of purchasing a machine for each nursing unit. Also, restocking each machine is a very time-consuming task. Implementation of this system requires a complete modification of the current drug dispensing process which many hospitals are reticent to undertake. The system claims no labor-saving advantages from its implementation. This system is covered under United States Patent No. 3,917,045 titled "Drug Dispensing Apparatus" and dated November 11, 1975.

Baxter Travenol offers a dispensing system from Samsung, a Korean company, which dispenses bulk solids into a package which is dispensed to the pharmacist. This system only dispenses the 200 most frequently used solids. A typical hospital pharmacy can contain over 1,500 different medications, many in liquid,

syringe or bottle form. These medications cannot be automatically dispensed by this system, but must be manually selected by the pharmacist.

5 Neither system allows the dispensed medications to be automatically returned to the storage area.

There is a need for an automated system which is able to dispense all dosage forms currently contained in a hospital pharmacy. Medicines should be automatically dispensed by the system per a patient order and placed in individual patient medication boxes for a pharmacist to check. Each drug and each patient box should be individually bar coded so that the accuracy of the dispensing process can be automatically checked by the system. Once drugs are returned to the pharmacy, the system should automatically return each drug to its proper location in inventory and credit the patient's account for the return. One system should also keep a running inventory and notify the user whenever inventory of a particular item drops below a preset level and whether the shelf life of an item has passed. With such a system, a hospital can recognize significant labor savings, as well as savings based on improved accuracy in the dispensing function and better tracking of inventory and expired medications.

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SUMMARY OF THE INVENTION

We provide an automated method and apparatus for selecting and restocking stored items, which is particularly useful for filling patient medication orders in a hospital pharmacy. The stored items must be packaged to be held in a storage rack. Preferably, each package contains a bar code corresponding to the package contents. The items are arranged in a main storage rack so that like items are in the same location and a predetermined location is provided for every item.

We prefer to provide a second rack or a designated portion of the main storage rack for receipt of new or returned items to be restocked. Such items can be randomly placed on this supply station for transmittal to their respective predetermined locations on the storage rack.

We also provide a means for picking items from and placing items in the storage rack and the supply station. The picking means preferably is comprised of a gripper assembly mounted on a transport vehicle which moves along a track or other controlled route. The gripper assembly preferably has a movable rod or other carrier for holding selected items, at least one vacuum head and associated controls for gripping and moving selected items. We prefer to provide a bar code reader for reading item packages.

We also prefer to provide a conveyor on which boxes, patient medication trays or drawers can be placed. The conveyor

is positioned so that the picking means can place selected items into appropriate containers on the conveyor.

We provide a processing unit with associated memory and data entry peripherals. This computer system receives the list of requested items, directs the picking means, checks the items selected and prepares reports. Data can be entered manually through a keyboard or bar code reader or electronically through an RS 232 port. Reports may be printed, displayed on a console or transmitted to a memory or another computer for later use.

Other details and advantages of our method and apparatus will become apparent from the description of the preferred embodiments shown in the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

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In the accompanying drawings, the preferred embodiments of the invention and preferred methods of practicing the invention are illustrated in which:

Figure 1 is a schematic representation of our present preferred system.

Figure 2 is a side view of a present preferred package.

Figure 3 is a perspective view of one present preferred storage rack.

Figure 4 is a perspective view of a portion of a second preferred storage rack.

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Figure 5 is a perspective view of a portion of a third preferred storage rack.

Figure 6 is a schematic representation showing the storage rack, conveyor and movable support structure which holds a gripper assembly.

Figure 7 is a schematic view of a present preferred gripper assembly.

Figure 8 is a front view of a present preferred gripper assembly.

Figure 9 is a side view of the gripper assembly of Figure 7 with the storing rod in a raised and extended position.

Figure 10 is a side view of the gripper assembly of Figure 8 with the storing rod in a lowered and partially retracted position.

Figure 11 is a diagram showing a preferred vacuum and pressure line for the gripper assembly.

Figure 12 is a schematic representation of the gripper assembly mounted on a vehicle.

Figure 13 is a perspective view of a rod with packages thereon connected to a support bar.

Figure 14 is a schematic representation of a side view of a first rod and a second rod and having packages thereon attached to a portion of the support bar.

Figure 15 is a schematic overhead view of an alternative system for filling an order.

Figure 16 is a flowchart of the filling process.

Figure 17 is a flowchart of the check process.

Figure 18 is a flowchart of the return process.

Figure 19 is a flowchart of the restocking process.

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DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings wherein like reference numerals refer to similar or identical parts throughout the several views, and more specifically to Figure 1 thereof, there is shown a schematic representation of a present preferred system 10 for filling orders, such as prescriptions for patients. The system 10 contains storage racks 12 for handling packages. We prefer to provide at least two storage racks 12 and arrange them parallel to one another. Various storage rack designs can be used and certain present preferred storage racks are shown in 15 Figures 3, 4 and 5. In our system, each package preferably contains only one product, although the product may consist of two or more related items, such as nut and bolt. When our system is installed in a hospital pharmacy, each package preferably 20 contains a single dose of medicine.

A present preferred package 14 is illustrated in Figure 2. Although the package could be a blister card or box, we prefer to use a clear plastic bag having a hole 15 to permit the package to be hung on a rod 30, 48, 65 or 66 shown in Figures 3, 6 and 14. Each package preferably has a bar code 16 and a 25 written description 17, which identify the contents of the

package. A white area 17a can be created on the clear plastic bag over which the written description 17 can be printed, stamped or even handwritten. The bar code and the written description may include not only the name of the product, but also its
5 quantity, weight, instructions for use and expiration date. We also prefer to position the bar code and label on the package so that there is a large unmarked area 62 through which one can see the contents of the package. Figure 2 represents a clear plastic bag for a unit dose of medicine. We can use a bag having a
10 perforation line for easy opening or a recloseable bag having an interlocking rib type seal. The perforation line or rib seal is located along line 13. This type of bag is useful in a hospital pharmacy which buys medicines in large or bulk quantities and must repackage the drugs in individual dose packages. Package 14
15 can be any desired size. We have used a rectangular package having dimensions indicated by arrows A, B, C and D, wherein A is 3.5 inches, B is 1.0 inch, C is 3.0 inches and D is 0.1875 inches. Alternatively, the package 14 can have A equal 5.0 inches, B equal 1.25 inches, C equal 5.0 inches and D equal
20 0.1875 inches.

An individual dose of medicine can be manually fed into an automated packaging system 98, as shown in Figure 1, which automatically seals the package and prints a bar code and typewritten label directly on the package. In a preferred
25 embodiment, we utilize the H-100™ packaging system as manufactured by Automated Packaging Systems of Twinsburg, Ohio.

With the addition of the Accu-Print™ 100 Programmable In-Line Direct Transfer Imprinter, also manufactured by Automated Packaging Systems, a bar code can be printed directly on the medicine package.

5 A storage rack 12, which may also be used for a supply station, is shown in Figure 3. This rack is configured to hold packages of the type illustrated in Figure 2. The rack has a rectangular frame 28, having an open front and back. Running across the back are a plurality of back rod supports 32 from
10 which the rods 30 extend. The frame 28 with rod supports 32 forms an X, Y coordinate system with each rod 30 and medicine packages 14 therein having a unique X, Y coordinate. Packages are placed in the storage rack so that each product is located at a known X, Y coordinate. Since every product is in a known X, Y
15 location, it is possible to direct an automatic picking means to any product location to select a desired item. The packages are segregated within the storage rack so that all packages in any given location have the same contents.

 Although we prefer to use racks in which packages are
20 hung on rods, other types of racks can be used for storage racks and supply stations in our system. In Figure 4, we show the upper portion of a rack having a rectangular frame 21 with an open front and closed back 23. Attached to the back 23 are sets of brackets 25 positioned to hold packages 27. To be held
25 securely in this rack, such packages must be fairly rigid. Blister cards and boxes can be used. If desired, a hole 15 could

be provided in the packages to permit them to be carried on a rod.

A top portion of another suitable rack having a rectangular frame 21, open front and closed back 23 is shown in Figure 5. This rack has a set of shelves 29, which may be inclined toward back 23. A set of dividers 31 separates groups of packages 27.

The racks of Figures 3, 4 and 5 have two important common features. First, the packages are held in locations having known X, Y coordinates. Those coordinates could be single X, Y values as may correspond to the position of the package holes 15 or a group of X, Y values defining an entire package. Second, there is sufficient clearance between packages to allow automated picking means to select, grab and replace individual packages.

Referring now to Figures 1 and 6, we provide storage racks 12 on either side of a track 42 over which a vehicle 44 may travel. The vehicle may be column-shaped as in Figure 6. Many types of drive systems could be used to propel the vehicle. For example, one could provide a motor indicated by block 47 to propel wheels (not shown) at the base of the vehicle. Alternatively, one may use a chain or cable running through the track 42 to pull the vehicle to any desired location. Whatever drive system is used should be capable of moving the vehicle to positions along the track which correspond to the X coordinates of the packages within the rack. Thus, computer 24, which

controls the drive system, can direct the vehicle 44 to a location in front of the package or packages to be selected.

Packages are selected by a picking means 38, preferably of the type illustrated in Figures 7 through 10. The picking means is mounted on column-shaped vehicle 44 in a manner to allow controlled vertical movement along that column. In this manner, the picking means 38 can be positioned at locations along column 44 which correspond to the Y coordinates of packages to be selected. The picking means 38 is controlled by a computer 24, or local area network of computers, having a database. The database has the order to be filled and a record of the predetermined locations 18 of each different product in the storage rack 12. The computer 24 guides the picking means 38 based on information contained in the database, such that the picking means 38 picks a package 14 according to the order to be filled. The picking means 38 can also include means, such as a bar code reader 26 as shown in Figure 7, for determining the identity 16 of a package 14 in the storage rack 12 or in a supply rack 20 and providing its identity 16 to the computer 24. The computer 24 guides the picking means 38 to select the desired packages and deliver them to a desired location. In the system of Figures 1 and 6, the packages are delivered to containers 36 located on conveyor 34. When the system is installed in a hospital pharmacy, the containers 36 are individual patient boxes in which the patient's medication is delivered from the pharmacy to the appropriate floor or nurses' station. The patient boxes

preferably are bar coded with a patient identification code.

After a patient's prescription is filled and the patient box 36 has all the medicine packages called for in the prescription, a conveyor belt 34 moves the patient box 36 to a check station 80.

5 An operator uses the check station bar code reader 82 to scan the bar code label on the filled patient box 36, see Figure 15. The patient identification number is taken from the inputted bar code and the prescription of the patient is displayed on the check station screen 84 of the check station console 86 connected to
10 the computer or network of computers 24. The operator then scans individual medicine package bar codes in the patient box 36. The identity of the medicine packages 14 in the patient box 36 is automatically checked for correctness with respect to the patient list on the station screen 84. If the medicine packages 14 in
15 the box 36 are correct, then the patient box is allowed to continue on towards the ultimate destination and the next filled patient box 36 is then checked. If the medicine packages 14 in the patient box 36 are not correct, then it is determined whether the error, whatever that may be, can be corrected. If the
20 correction can be made, then the record on the check station screen 84 is corrected and the procedure for verifying correctness is then repeated. If the problem cannot be corrected, then the patient box 36 can be manually filled or resubmitted to be filled with missing doses by the system and the
25 computer is notified that the patient's prescription has not yet been filled.

In the event that a patient does not take all of the medicine which has been prescribed, unused medicine is returned to the hospital pharmacy in the patient box 36. Typically, patient boxes are transferred in a carrier which contains several patient boxes. This carrier is received at a return station 92. The patient box 36 is first removed from the carrier returned from a nursing unit. An operator uses the return station bar code scanner 91 to scan the bar code on the patient box 36. The nursing unit number and the patient identification number is then parsed from the inputted bar code of the patient box 36. The database is then accessed and the patient dispensing record is retrieved. On the return screen 94, there is displayed for a particular patient at the operator console 96, a list of the medicines ordered and dispensed to the patient. The operator of the return station 92 then scans the identity 16 of the medicine in the patient's box 36 with the return station bar code scanner 91. The medicine packages 14 that are found thereon are verified as being dispensed to the patients. The expiration date of the medicine in the medicine package 14 is then determined. If the expiration date of a medicine in the medicine package 14 has passed, then the medicine package is discarded. If the expiration date has not passed, then the returned medicine package 14 is placed in the supply rack 20. If there is more medicine to be returned, the process is then repeated. If there is no more medicine in the patient box 36 to return, then the return station console 96 is checked to verify the correctness of

the medicine returned. If the screen is correct, then the return record is accepted and the database is updated. If the screen 94 is incorrect, then the screen is corrected to correspond to the returned medicine packages 14 and the patient box 36. In this manner, the system will have developed a record of all medication given to each patient. That record can be transferred to a hospital billing system and used for billing purposes. The data can also be input into an inventory monitoring system and used to generate reports or orders for new supplies.

We prefer to provide supply racks 20 which serve as a holding area for returned and new products. These racks are comparable to storage racks 12 and are accessed by the picking means 38 in the same manner. However, products are randomly placed in the supply racks either manually or by the picking means. The supply racks 20 are shown in Figure 1 at a position where they are accessible to the picking means. However, we prefer that the supply rack be movable. Then it could be moved to other convenient locations, such as near packaging system 98 for refilling.

When packages 14 are to be restocked onto the storage racks 12, the supply rack 20 is placed in a predetermined position alongside the storage racks 12. By being placed in a predetermined position, the X and Y coordinates at which packages may have been placed in return racks 20 are known to the computer 24. Picking means 38 is then positioned for a given package in the return rack. The bar code reader 26 on the end of picking

means 38 then scans the identity 16 of the package 14 that is about to be picked. The process of picking the returned packages 14 is the same as occurs with respect to the process of obtaining packages 14 from the storage rack 12. The only difference is that the order of the packages 14 and their identity as they are picked is saved in the computer 24. When the picking means is then moved to the storage racks 12 the computer knows the identity of the respective medicine package 14 on the picking means 38, which is about to be placed back onto the storage racks 12.

The picking means 38 includes at least one gripper assembly illustrated in Figures 7 through 12. As shown in Figure 12, we prefer to provide a support bracket 41 extending from column 44. This bracket can move along column 44 in a vertical direction. A third actuator 43 is attached to bracket 41. Mounting 39 permits movement along rod 41 and movement at bar 43 in a direction normal to rod 41. A picking means 38, which preferably is the gripper assembly of Figures 7 through 10, is mounted to actuator 43 through actuator 45, which permits a 180-degree rotation of the gripper assembly. Actuator 43 permits horizontal movement of picking means 38 in the Z direction.

The gripper assembly is preferably comprised of a housing 49, as shown in Figure 7 having means for storing medicine packages 14, such as a storing rod 48. Assembly 38 also contains means 50 for obtaining a package 14. The obtaining means 50 is slidably attached to the housing 49 such that it can

move in a Z direction, which is perpendicular to the X, Y directions, to pick a package 14 from a support rod 30 in the storage rack 12 or supply rack 20. Identifying means, for example, the bar code reader 26 shown in Figure 8, is mounted on
5 housing 49 such that it can identify a package 14 to be picked by the obtaining means 50. The obtaining means 50 preferably includes means for producing a suction, such as a vacuum generator 58 controlled by a vacuum sensor 58a which draws a vacuum through vacuum line 55 and vacuum valve 54. The obtaining
10 means 50 also preferably includes an extension rod 52 in fluidic communication with a pneumatic in/out cylinder 53 and associated valve 59, as shown in Figures 8 and 11. The extension rod 52 is slidably attached with respect to the Y and Z directions to the housing 49. A suction is maintained through the vacuum lines 55
15 when the vacuum valve 54 is activated to supply air to vacuum generator 48. The obtaining means 50 also can include a suction head 56 connected to the extension rod 52 through which a package is picked with suction. The vacuum sensor 58a will sense when a package is properly positioned on the suction head 56, for
20 example, by detecting air flow therethrough. The suction head 56 and carried package are then moved to the storing means, such as the storing rod 48, to deposit the package thereon. Preferably, the storing means is a storing rod 48 which extends from the housing 49 such that the suction head 56 and the extension rod 52
25 can deposit a package 14 thereon. The obtaining means 49 is also composed of a cylinder 48A which allows an assembly of both

holding rod 48 and pusher plate 57 to move in the Y direction. The holding rod 48 is also attached to a cylinder 48B which allows the storage rod to retract and extend in reference to the obtaining means. The pusher plate 57B is also attached to a
5 cylinder 57A which allows the plate to move in the positive Z direction. This action is necessary to push drugs off of the storage bar 48 during the dump process.

The extension rod 52 can move in the Y and Z directions to place a picked package on the storing rod 48 under the action
10 of up/down cylinder 51 and in/out cylinder 53. Valve 57 activates cylinder 51 to move both the cylinder 53 and the extension rod 52 in the Y direction. Valve 59 activates cylinder 53 to move the extension rod in the Z direction. Valve 54 provides air to the vacuum generator 58 to suction in head 56
15 sufficient to pick a package from a rod 30 of the support structure 28 and then hold it to the suction head 56. The suction head 56 preferably has two faces 60 and 61 through which suction can be drawn. One face 60 is capable of picking a package from a rod 30 of the storage rack and the other face 61
20 is capable of picking a package from a storing rod 48 of the picking means 38. As shown in Figure 2, each package preferably has a face 62. The packages are held by the storing rod 48 and the rods 30 of the support structure 38 such that the face 62 of each package is parallel to the Y axis. The outside face 60 is
25 utilized when a package 14 is being removed from a rod 30 in the supply rack, and the inside face 61 is utilized when a package is being removed from the storing rod 48 of the picking means 38.

In an alternative embodiment, the rods 30 extend from the double rod support bar 64 in sets of two as shown in Figure 14. A first rod 65 and a second rod 66 of each set point essentially in the 2 direction, but approximately 180 degrees apart from each other. This embodiment shown in Figure 15 includes a first tooling support structure 70, a second tooling support structure 72, a first end of arm tooling 67 and a second end of arm tooling 68 that picks the packages 14. Each tooling support structure has at least one column type vehicle 44 and at least one track 42 to support the column 44. Column 44 moves along the respective tracks 42 to pick a given package 14 from a corresponding support rod 30, or restock a support rod 30 with an associated package 14.

In the operation of the preferred embodiment in a hospital, doctors visit patients in nursing units and write out medication orders for each patient. A patient is typically placed on a certain medication treatment which requires multiple doses of medication over a period of a day. Some medications are administrated at certain times of the day and possibly at intervals of several hours. Patients may also request certain medications on an elective basis for disorders such as headaches. These requests are included in the doctor's order that is sent from the nursing unit to the central pharmacy of the hospital. Once an order is received by the pharmacy, it is checked by registered pharmacists and input into the pharmacy information system. These orders reflect not only orders that are added to a

particular patient's treatment, but changes in the medication treatment. The pharmacy information system combines this information with the patient's existing medication schedule and develops a patient medication profile. A fill list is generated from that profile. The fill list is a list of all the medications that must be distributed to all patients for the day. This information is sent to the pharmacy printer where a hard copy is generated.

Means for communication between the pharmacy information system and the present system exist by either tapping the serial data print stream of the pharmacy information system or by a direct bi-directional communication link. The relevant information concerning the patient including drug type, dosage and frequency is placed in the database of the system. The database contains information about which drugs are to be dispensed that day to the patient and all drugs that have been dispensed in the past to the patient. Information from the pharmacy information system is received on an ongoing basis throughout the day. New information can be entered into the database at any time. In addition to the fill list, new orders and patient admittance, discharge and transfer information are received and stored.

Figure 16 is a flowchart with respect to the processing of a patient prescription. A similar method would be followed for retrieving other stored products. The software for processing an order is started as indicated by box 180. Then the

steps indicated by boxes 181 thru 202 are followed. Before a box is loaded onto the conveyers, the operator scans the location barcode and the patient barcode on the patient box. The system then checks its database to ensure that that patient is still at that location. If a new patient has been transferred or admitted to that location, the system automatically generates a barcode label with that patient's identification number on it. This label is then manually applied to the patient box and the box is placed on the conveyor. If no patient is registered in the room, the box is placed aside and the operator proceeds with the next patient box to be filled. When the turn comes for the patient box 36 to be filled, it is shuttled into a position on the conveyor 34 such that the gripper assembly 38 can communicate with the box 36 as shown in Figure 1. A stationary bar code reader 90 reads the bar code on the patient box 36. The patient identification number is then parsed from the bar code input. This causes the fill list for that particular patient to be retrieved from the database as indicated in box 185. The fill list is converted to data consisting of locations and number of picks. At box 187 the data is then downloaded to a robot controller or gantry control program in order for the computer 24 to control the end of arm tooling 38 such that it knows what packages 14 to obtain and place in the patient box 36.

The system is now ready to pick the drugs 188. First, the column-type vehicle 44 goes to the rack where the drug to be selected is stored and stops at the X coordinate of that drug

package. The picking means 38 then moves along the column 44 to the Y coordinate of the medicine package to be picked. It is also turned to the proper storage rack 12 which has the desired package 14. These actions may also be performed simultaneously by the system 189.

When the end of gripper assembly 38 is properly positioned, the bar code reader 26 reads 190 the identity 16 on the medicine package 14 in order to confirm that it is the proper medicine package to be picked with respect to the patient's prescription. After such confirmation the suction rod 52 extends in the Z direction by pneumatic cylinder 53 such that the outside suction face 60 contacts the package face 62. Valve 54 activates a suction through the air lines 55 such that a suction drawn through the suction face 60 grabs the medicine package 14 sensor 58a detects when the contact is proper between the suction face 60 and the medicine package 14, as indicated at box 192 of Figure 16. Then the extension rod 52 retracts from the rod 30 of the support structure 28, pulling the medicine package 14 with it. Once the medicine package 14 is clear of the rod 30, the extension rod 52 positions the medicine package 14 that it has obtained, upon the storing rod 48 as indicated by box 193.

The system now prepares for the next pick. This operation is indicated by box 194 includes several actions. Once the package 14 is on the storage rod 48, the vacuum valve 54 terminates the suction and the medicine package is released from the suction face 60. The vacuum valve 57 then activates the

cylinder 51 such that the extension rod 52 (and cylinder 53) are moved in the Y direction so the bottom of the suction head 56 is above the package 14 on the storing rod 48. The extension rod is then moved forward in the Z direction and downward in the Y
5 direction by the respective valves and cylinders to clear the package and position the suction head 56 for the next pick. In an alternative embodiment the storage rod 48 is moved down rather than moving suction head up 56 to provide clearance between them when the suction head moves in a Z direction. The computer 24
10 then notes that the medicine package 14 with the appropriate medicine has been picked.

The final series of operations indicated by boxes 195 thru 202 involves a comparison of the drug identified by the reader as having been picked with the list of drugs to be
15 selected. If an incorrect drug was selected the gripper assembly moves to a reject area, places the incorrect drug there, removes that drug from the list of items selected and is ready to pick more drugs. If the correct drug was selected the system records that fact and is ready to pick more drugs. The process is
20 repeated for all the medicine identified in the patient's prescription until all of the medicine packages 14 needed have been picked.

The gripper assembly containing all desired packages then positions itself so that it is over the patient box 36. The
25 gripper assembly 38 then positions the outside suction face 60 behind the medicine packages on the storing rod 48 that have been

collected. Packages can be dropped into the patient box by retracting rod 48 by actuating cylinder 48A to the position shown in Figure 10. The storage rod 48 is then moved into the negative Z direction so that the suction face no longer holds the packages in place. The cylinder 48B then causes the storage rod 48 to be retracted which will cause the drugs to be dumped into the box.

Alternatively, the suction head may be stroked forward in the Z direction so that all packages 14 are pushed off the storing rod 48 into the patient box 36. Movement of the suction head is accomplished by the vacuum system. Vacuum valve 57 activates the cylinder 51 to retract in the positive Y direction such that the bottom of the suction head 56 is above the tops of the packages 14 on the storing rod 28. Then vacuum valve 59 activates cylinder 53 to retract the extension rod 52 in the negative Z direction such that the outer suction face 60 is behind all of the medicine packages 14 on the storing rod 48. Vacuum valve 57 is then activated such that the suction head 56 is dropped back down in the negative Y direction to be behind the packages 14. Finally, vacuum valve 59 is activated such that the extension rod 52 is extended in the positive Z direction and the front suction face 60 pushes all packages 14 off the storing rod 48 into the patient box 36.

In the event that the wrong medicine package 14 was scanned and is picked, or the medicine has expired, then picking means 38 will have placed those packages in a reject or return area, where the medicine package 14 can be disposed. A pharmacy

technician will then manually sort the drugs in the reject area, removing expired drugs and placing the others in the supply rack in order that they might be returned to their correct location in the system. The process is then repeated for the next drug on the prescription list that has not yet been obtained.

The flow chart of Figure 17 is the process of checking the selected packages which have been placed in a patient box. Such checking is performed at the check station. The process begins by calling up the check program indicated by box 105. The bar code on the patient box is scanned 106 and the patient number portion of the bar code is identified 107. The patient number is displayed 108 on the screen at the check station. Then the packages in the patient box are scanned 109. The identification of the packages is compared with the list of drugs that had been ordered for the patient in a verify step 110. If correct packages are in the box, the checking of the box is complete and the system is ready for the next box 111. If the packages in the box do not match the order the system determines if the problem can be corrected 112. If so, the correction is made 113 and the verify step is repeated. If not, the box is dumped 114 and the order is recorded as not filled or the box is resubmitted and the missing medications are filled by the system. For example, should the system determine that an item is missing it may either create a modified list and send the box on with a modified list or it may instruct the picking means to get the missing item.

The return process is shown in the flow chart of Figure 18. The process starts 115 by calling up the return program. The patient box containing the returned items must be positioned so that the patient box can be scanned 116 for the patient identification number 117 and the nursing unit from which the box was returned. If the box has come from the proper nursing unit the system retrieves the patient dispensing record 120 and displays that record 121 for the operator. Next the packages are scanned 122. The system preferably verifies 123 that the scanned packages had been sent to the patient making the return. Next the system checks each package 124 to determine if the drug is useful or if it has expired, been recalled or otherwise should not be returned to the supply rack. If no, the package is discarded 125. If yes, the package is returned to the supply rack 126. If more drugs remain in the box the process is repeated 127. If no packages remain, the system may further process the list of returned packages 128 to modify the patient's record, update the system inventory log or display the list of returns for review by the operator.

The process of restocking returned or new packages to the storage rack is diagramed in Figure 19. These packages are manually placed on a return or supply rack and the program for restocking is called up 130. The program causes the picking means to be positioned 131 so that the gripping assembly can pick packages from the return or supply rack. The bar code on the first package is scanned 132 and the portion of the scanned bar

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code which identifies the drug is found 133. The system then checks the database 134 for the location in the storage rack which has been designated for the identified product. The system extends the vacuum head 135 to engage the package. Suction is
5 applied 136 and a suction sensor is checked. This should cause the package to be held by the gripper assembly which fact will be confirmed by the sensor 137. The gripper assembly positions the package 138 on the storage rod 48 in the gripper assembly. Then the suction is released and the gripper assembly is ready to
10 place additional packages on the storage rod. If more packages remain on the return or supply rack 140, the process is repeated until all packages are on the storage rod or the storage rod is full. The gripper assembly is then moved to a position 141 in front of the storage rack to properly place the outermost package
15 on the storage rod. That package is grasped 142 using back suction cups 61 (see Figure 11). The extension rod 52 is retracted in the negative Z direction such that the inside suction face 61 is in contact with the medicine package 14. The sensing means 58 determines whether proper contact is made. Then
20 the extension rod 52 is moved a predetermined distance in the positive Z direction 143 to place the medicine package over a rod 30 of support structure 28. Vacuum valve 54 is then deactivated 144 to stop suction, allowing the medicine package 14 on the suction face 61 to drop away therefrom. The extension rod 52
25 then moves in the negative Z direction towards the medicine packages 14 on the storing rod 48 to repeat the process. While

it moves back to obtain another medicine package 14, the sensor 58 trips when contact is made. The process can be repeated 141 until there are no more medicine packages 14 on the storing rod 48. The computer 24 knows when to stop returning packages since
5 it knew how many packages had been placed on the storing rod 48.

In the event that all drugs to be returned or restocked at a particular storage location are identical the process is some what different. Packages are picked from the supply rack in the method detailed above. The gripper assembly is then moved to
10 a position in front of the storage rack to place the remaining packages on the storage rod. Cylinder 48A causes the assembly of storing rod 48 and pusher plate 57B to move in the negative Z direction. Storage rod 48 is co-linear with a rod 30 of support structure 28. Pusher plate 57B then moves in the positive Z
15 direction pushing all remaining packages on storage rod 48 on to rod 30.

The restocking of the storage racks 12 can be carried out during the evening when packages are not being gathered to fill orders. Alternatively, restocking can be carried out
20 simultaneously with picking if the system 10 has a pair of rods as shown in Figure 14, a first end of arm tooling 67, second end of arm tooling 68 and a first tooling structure 70 and a second tooling structure 72 is utilized, as shown in Figure 15. While, for instance, the first end of arm tooling 67 is picking medicine
25 packages 14 to fill a patient's prescription, the second end of arm tooling 68 can be restocking the second side of the

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storage area 12.

Although the invention has been described in detail in the foregoing embodiments for the purpose of illustration, it is to be understood that such detail is solely for that purpose and
5 that variations can be made therein by those skilled in the art without departing from the spirit and scope of the invention except as it may be described by the following claims.

We claim:

1. A system for selecting and delivering packages from a stored area to fill orders comprising:

- a) a storage area comprised of a plurality of locations each location being sized and configured to hold at least one package in a manner so that the package can be placed into and removed from the locations by automated picking means, each location having a distinct x, y coordinate;
- b) automated picking means sized and configured to be able to hold packages, to select packages from storage area locations and place packages in storage area locations in accordance with instructions received from a computer, the picking means having a gripper for grasping and moving individual packages;
- c) a computer having at least one memory which contains a program for directing the picking means to chosen storage area locations and a database containing at least one x, y coordinate location in the storage area for each package held within the storage area, wherein only one type of package is stored in each x, y coordinate location.

2. The system of claim 1 wherein the gripper is a vacuum head.

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3. The system of claim 1 also comprising a sensor attached to the picking means for determining when a package is grasped by the gripper.

4. The system of claim 1 wherein at least one package has a machine readable label identifying contents of the package and also comprising a package reader attached to the picking means for reading the label.

5. The system of claim 4 wherein the label is a bar code and the reader is a bar code reader.

6. The system of claim 4 wherein the label also contains an expiration date.

7. The system of claim 1 wherein the picking means contains a picking means storage area for holding packages selected by the picking means.

8. The system of claim 7 wherein the picking means storage area is comprised of at least one storage rod and holes are provided in the packages to permit the packages to be held on the storage rod.

9. The system of claim 1 also comprising a supply station for receiving new and returned packages, the supply station having a plurality of locations each location being sized and configured to hold at least one package in a manner so that the package can be placed into and removed from the locations by automated picking means, each location having a distinct x, y coordinate.

10. The system of claim 9 wherein the supply station is movable and is sized to be removably positioned adjacent the storage area.

11. The system of claim 1 wherein the storage area is comprised of a plurality of rods and a hole is provided in each package to permit the package to be held on the rods.

12. The system of claim 1 also comprising at least one data transmission port attached to the computer through which a list of packages to be selected can be input and a list of packages selected by the system can be output.

13. The system of claim 1 wherein the memory contains a program for checking compatibility of products in packages selected by the picking means with other products listed in the database.

14. The system of claim 1 also comprising a conveyor positioned to receive packages from the picking means.

15. The system of claim 14 also comprising a plurality of containers positioned on the conveyor, the containers being sized and positioned to receive packages from the picking means.

16. The system of claim 15 wherein the containers have machine readable labels.

17. The system of claim 16 wherein the labels are bar codes.

18. The system of claim 15 wherein each package and each container have machine readable labels.

19. The system of claim 18 wherein the labels are bar codes.

20. The system of claim 18 also comprising a check station located adjacent the conveyor, the check station having reading means for reading the machine readable labels.

21. The system of claim 20 wherein the reading means is connected to the computer in a manner to input information from the machine readable labels; the computer having a program for

storing the input information in memory and for comparing the input information to other information contained in the database.

22. The system of claim 1 wherein the packages contain individual doses of medicine.

23. The system of claim 1 also comprising a track over which the picking means travels according to directions supplied by the computer also comprising means for moving the picking means over the track.

del 24. A system for selecting and delivering packages from a holding to fill orders comprising:

- a) holding means comprised of a frame having a plurality of support rods for holding medicine packages, each rod associated with a given medicine and holding medicine packages with only the same medicine;
- b) means for supplying medicine packages to the support rods;
- c) means for picking medicine packages from the support rods in accordance with instructions received from a computer, said picking means being able to access the holding means and the supply means;

- d) a computer having a database containing the locations of all packages in the holding means able to receive orders for packages and able to direct the means for picking packages.

25. A system as described in claim 24 wherein the structure includes a plurality of rod supports from which the rods extend, said structure with back rod supports form an X, Y coordinate system with each rod and medicine packages therein having a unique X and Y coordinate, said picking means disposed adjacent said structure such that a given medicine package on an associated rod can be picked by the picking means to fill a patient's prescription; or a given medicine package in the supplying means can be picked by the picking means to restock the associated rod.

a 26. A system as described in claim 25 including a conveyor in communication with the picking means; and patient prescription boxes which are moved by the conveyor to the picking means such that the picking means provides the medicine packages it has picked to fill a given prescription to an associated box.

Sub 27. A system as described in claim 26 wherein the picking means includes at least one gripper that picks the medicine packages; and a tooling support structure having at least one column to support the tooling and at least one row to

support the column such that the tooling moves along the column as the column moves along the row to pick a given medicine package hanging from a corresponding support rod, or restock a given medicine package on a corresponding support rod; and means for moving the column with respect to the row, said moving means controlled by the computer.

28. A system as described in claim 27 wherein the tooling is comprised of

a housing;

means for storing medicine packages attached to the housing;

means for obtaining a medicine package, said obtaining means slidably attached to the housing such that it can move in a Z direction, which is perpendicular to the X and Y directions, to pick a medicine package from a support structure when the housing is adjacent to and aligned with a support rod, and can move in the Z direction to place a picked package on the storing means; and

wherein the identifying means is part of the gripper such that it can identify a package to be picked by the obtaining means, each of said packages having an identity disposed on them which can be read by the identifying means.

⁵~~29~~. A system described in claim ⁴~~28~~ wherein the identity of each package is a bar code, and the identifying means includes a bar code reader disposed on the obtaining means.

Sub
a-7

30. A system as described in claim 29 wherein the obtaining means includes means for producing a suction; a suction rod in fluidic connection with the suction producing means, said suction rod slidingly attached with respect to the Y and Z directions to the housing and maintaining a suction therethrough when the suction producing means is activated;

a suction is connected to the suction rod through which a medicine package is picked with suction; and means for sensing when a package is properly positioned on the suction head such that the package rod is then moved to the storing means and deposits the package thereon.

⁸~~31~~. A system as described in claim ⁷~~30~~ wherein the storing means is a storing rod which extends from the housing such that the suction head and the suction rod can deposit a package thereon.

⁹~~32~~. A system as described in claim ⁸~~31~~ wherein the tooling includes valves and pneumatic cylinders for moving the suction rod in the Y and Z direction; and a vacuum pump for

providing suction to the suction rod and support head sufficient to pick a package from a rod of the support structure and then hold it to the suction head.

¹⁰
~~33~~. A system as described in claim ⁹~~32~~ wherein the suction head has two faces through which a suction can be drawn, each face capable of picking a package.

¹¹
~~34~~. A system as described in claim ¹⁰~~33~~ wherein the two faces are parallel to each other and are parallel to the x-axis, and wherein each package has a face and the package are held by the storing rod and the rods of the support structure such that the face of each package is parallel to the x-axis.

^{Sub 35}
~~35~~. A system as claimed in claim 24 wherein the rods extend from the back rod supports in sets of two, with a first rod and a second rod on each set pointing essentially in a Z direction, which is perpendicular to the X and Y directions, but approximately 180° apart from each other, and wherein the picking means includes a first gripper and a second gripper that picks the medicine packages; and a first and second tooling support structure, each tooling support structure having at least one column and at least one row to support the column, such that the first and the second tooling moves along the respective column and the respective column moves along the respective row of the first and second tooling support structure, respectively, to pick

a given medicine package from a corresponding support rod, or restock a support rod with an associated medicine package.

36. A system as described in claim 20 wherein the picking means includes at least one gripper that picks the packages; and a tooling support structure having at least one column to support the tooling and at least one row to support the column such that the tooling moves along the column as the column moves along the row to pick a given package hanging from a corresponding support rod, said gripper able to turn on the column to pick packages on either the first or second holding means; and

means for moving the column with respect to the row, said moving means controlled by a computer and in communication therewith.

08-452640



ABSTRACT OF THE DISCLOSURE

A system for filling orders, such as prescriptions for patients, comprising a device for holding packages. Each package
5 has the same type of contents being held in a predetermined location by the holding device. Each package has an identity which defines the contents therein. The holding device has a plurality of predetermined locations corresponding to a plurality of different types of contents. Additionally, the system is
10 comprised of a device for supplying packages to the holding device. Also, there is a device for picking a package from the holding device that is identified in the order for the purpose of restocking the holding device. The picking device is in communication with the holding device and supplying device. In a
15 preferred embodiment, the contents of each package is a single dosage of medicine.

Docket No. 920015

DECLARATION AND POWER OF ATTORNEY

I, the below named inventor, hereby declare that:

My residence, post office address and citizenship is as stated below next to my respective name.

I believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled AN AUTOMATED SYSTEM FOR SELECTING AND DELIVERING PACKAGES FROM A STORAGE AREA, the specification of which was filed on April 21, 1992, and bears Serial No. 07/871,832.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a).

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing of this application.

<u>Application Serial No.</u>	<u>Filing Date</u>	<u>Status</u> <u>(Patented, Pending, Abandoned)</u>
<u>07/469,217</u>	<u>1/24/90</u>	<u>Abandoned</u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>

I hereby declare that all statements made hereby of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby appoint the following attorney(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith: Lynn J. Alstadt, Reg. No. 29,362; George P. Baier, Reg. No. 26,717; Paul A. Beck, Reg. No. 22,289; Michael L. Dever, Reg. No. 32,216; Craig N. Killen, Reg. No. 35,218; George Raynovich, Jr., Reg. No. 19,829 and Alvin E. Ring, Reg. No. 18,697.

Address all telephone calls to Lynn J. Alstadt
Address all correspondence to Buchanan Ingersoll Professional Corporation,
56th Floor, 600 Grant Street
Pittsburgh, Pennsylvania 15219
(412) 562-1632

MA000350

1.00 Full name of sole or first inventor Sean C. McDonald
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 Post Office Address 419 South Braddock Avenue, Pittsburgh, Pennsylvania 15221

2.00 Full name of second joint inventor, if any Ellen J. Hertz
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 Residence Clemmons, Forsyth County, North Carolina NC Citizenship USA
 Post Office Address 4232 Lake Cliff Drive, Clemmons, North Carolina 27012

3.00 Full name of third joint inventor, if any James A. Smith
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 Residence Allison Park, Allegheny County, Pennsylvania PA Citizenship USA
 Post Office Address 3909 Ash Drive, Allison Park, Pennsylvania 15101

4.00 Full name of fourth joint inventor, if any Gregory Toto
 Inventor's Signature *Gregory Toto* Date 6/18/92
 Residence Santa Cruz, Santa Cruz County, California CA Citizenship USA
 Post Office Address 815B Corcoran Avenue, Santa Cruz, California 95062

Full name of fifth joint inventor, if any _____
 Inventor's Signature _____ Date _____
 Residence _____ Citizenship _____
 Post Office Address _____

PATENT LAWYER'S DECLARATION

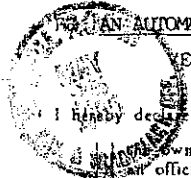
MA000351

Applicant or Patentee: Sean C. McDonald et al.

Attorney's Serial or Patent No. _____

Docket No.: 920015

Filed or Issued: _____

AN AUTOMATED SYSTEM FOR SELECTING AND DELIVERING PACKAGES FROM A STORAGE AREAVERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS
(37 CFR 1.9(f) and 1.27(c)) - SMALL BUSINESS CONCERN

I hereby declare that I am

owner of the small business concern identified below:

an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN Automated Healthcare, Inc.ADDRESS OF CONCERN 261 Kappa Drive
Pittsburgh, Pennsylvania 15238

I hereby declare that the above identified small business concern qualified as a small business concern as defined in 37 CFR 1.213-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention, entitled AN AUTOMATED SYSTEM FOR SELECTING AND DELIVERING PACKAGES FROM A STORAGE AREA by inventor(s) Sean C. McDonald
Ellen J. Hertz, James A. Smith and Gregory Toto
described in

☒ the specification filed herewith
application serial no. _____ filed _____
patent no. _____ issued _____

If the rights held by the above-identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below* and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR 1.9(d) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e). *Note: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

NAME _____

ADDRESS _____

☐ Individual☐ Small Business Concern☐ Nonprofit Organization

NAME _____


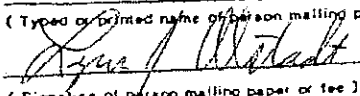
ADDRESS _____

☐ Individual☐ Small Business Concern☐ Nonprofit Organization

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made of information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING Sean C. McDonaldTITLE OF PERSON OTHER THAN OWNER PresidentADDRESS OF PERSON SIGNING 261 Kappa DrivePittsburgh, Pennsylvania 15238SIGNATURE Sean McDonaldDATE 4/20/92

CERTIFICATE OF MAILING BY "EXPRESS MAIL" UNDER 37 CFR 1.10 - SEPARATE PAPER -		ATTORNEY'S DOCKET NO. 950441
	IN RE APPLICATION OF Sean McDonald et al.	
	SERIAL NUMBER	FILED May 25, 1995
	FOR AN AUTOMATED SYSTEM FOR SELECTING PACKAGES FROM A STORAGE AREA	
	CRT. ART UNIT	EXAMINER
<p style="text-align: center;"> "Express Mail" mailing label number <u>B 84267047</u> </p> <p style="text-align: center;"> Date of deposit <u>May 25, 1995</u> </p> <p style="text-align: center;"> I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231. </p> <p style="text-align: center;"> <u>Lynn J. Alstadt, Esq.</u> <small>(Typed or printed name of person mailing paper or fee)</small> </p> <p style="text-align: center;">  <small>(Signature of person mailing paper or fee)</small> </p>		
<small>Patent and Trademark Office • U.S. DEPT. of COMMERCE</small>		

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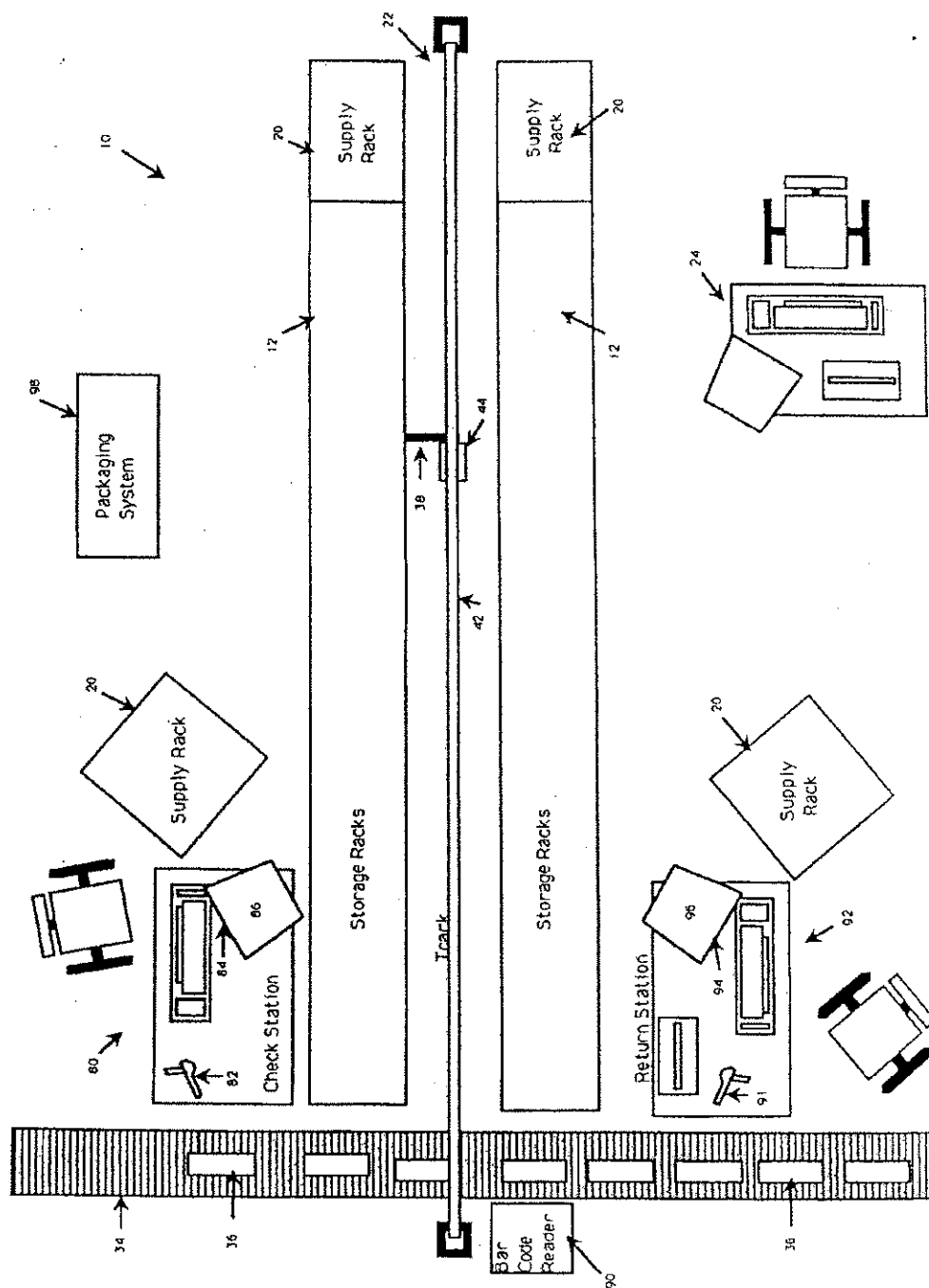


Figure 1

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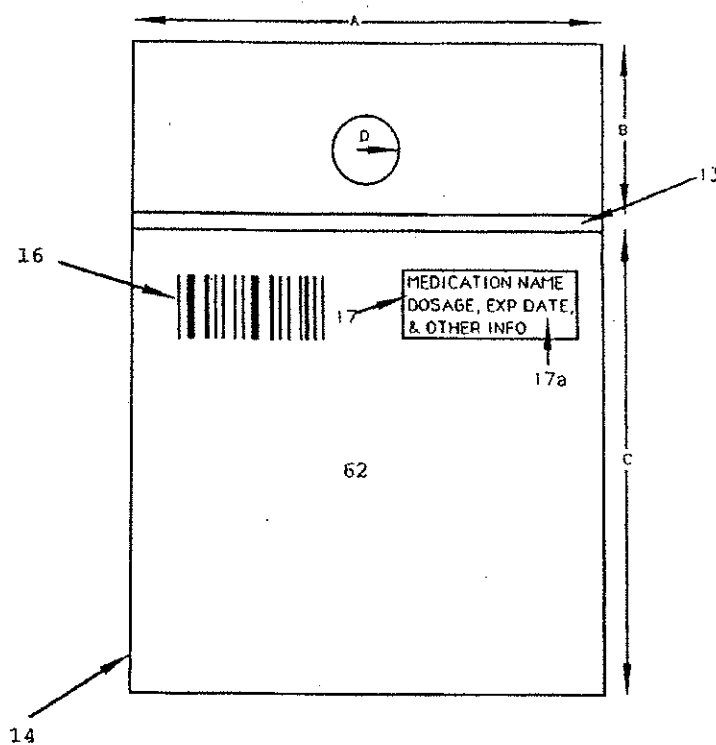


Figure 2

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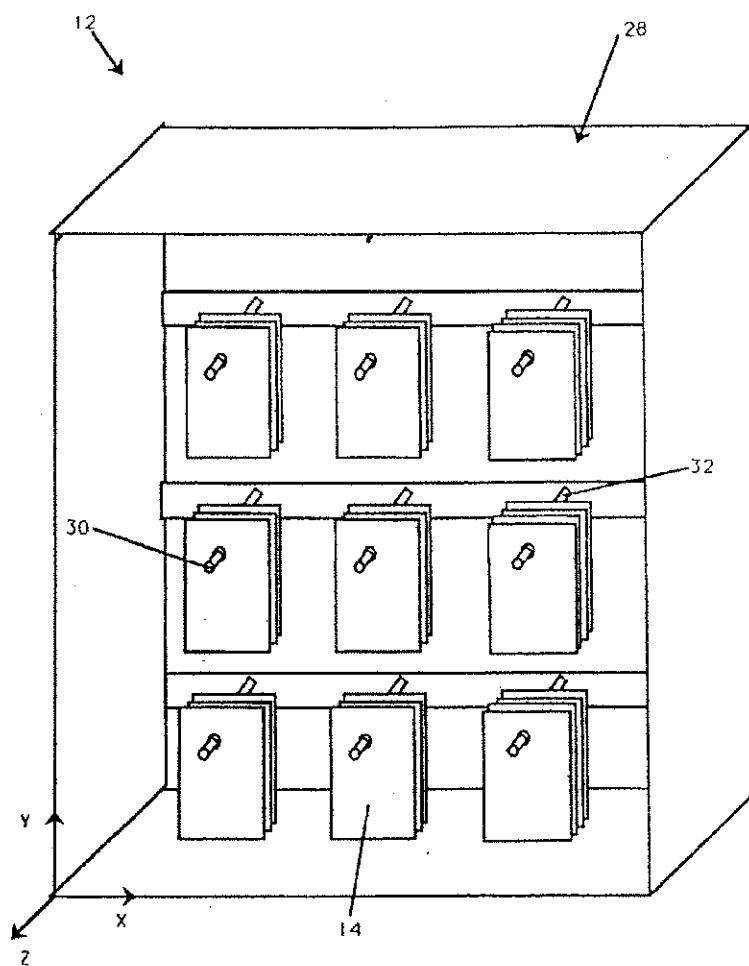


Figure 3

00/452646

APPROVED	0.0. FIG.
BY	CLASS
DATE/TIME	SUBCLASS

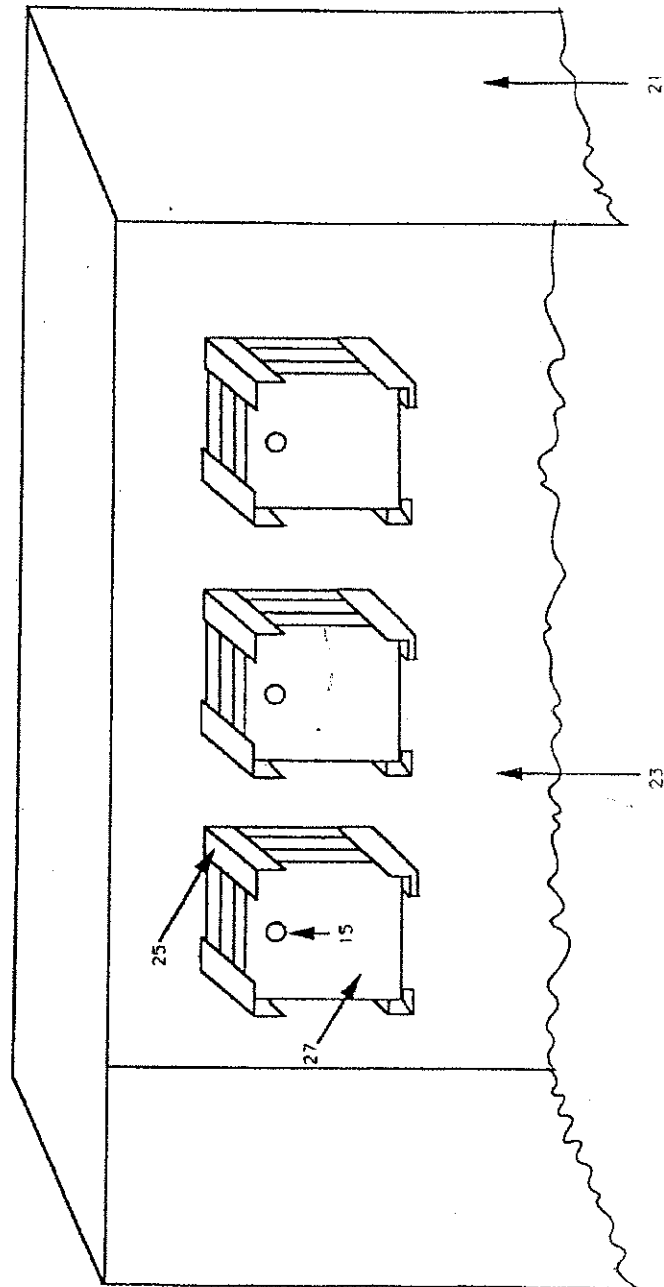
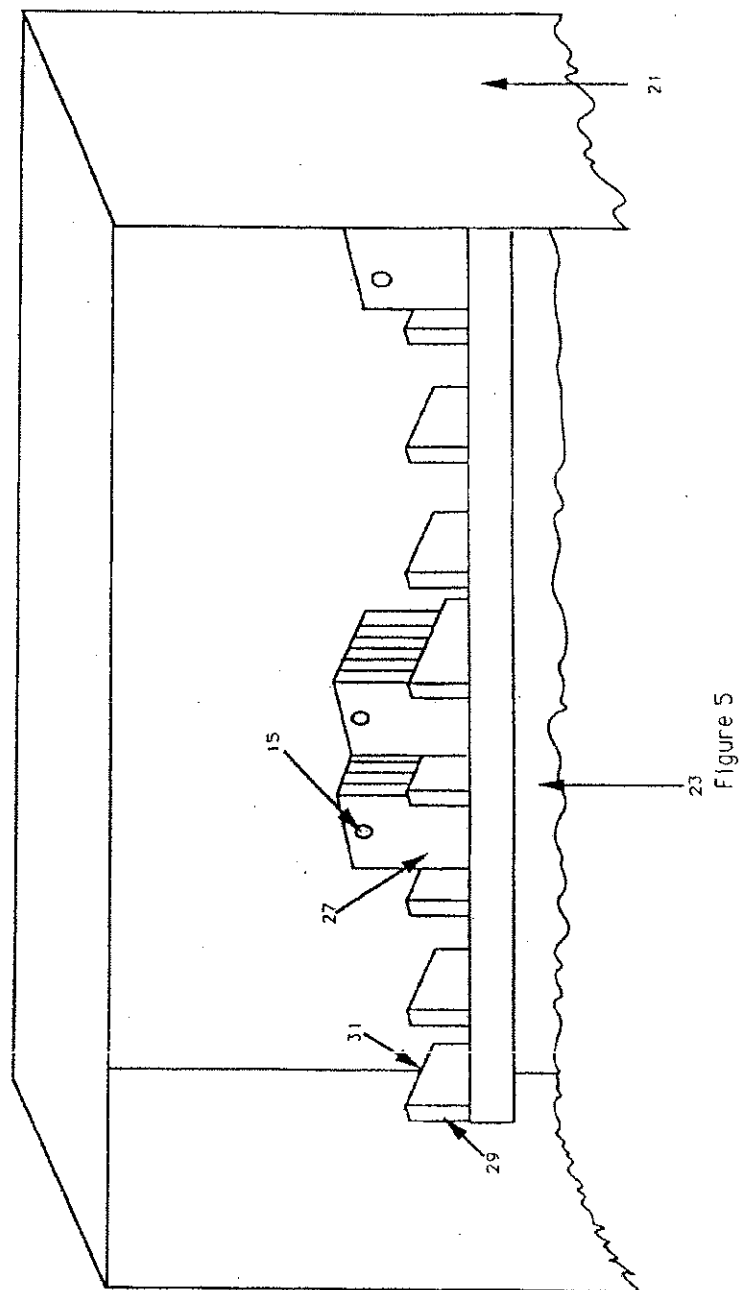


Figure 4

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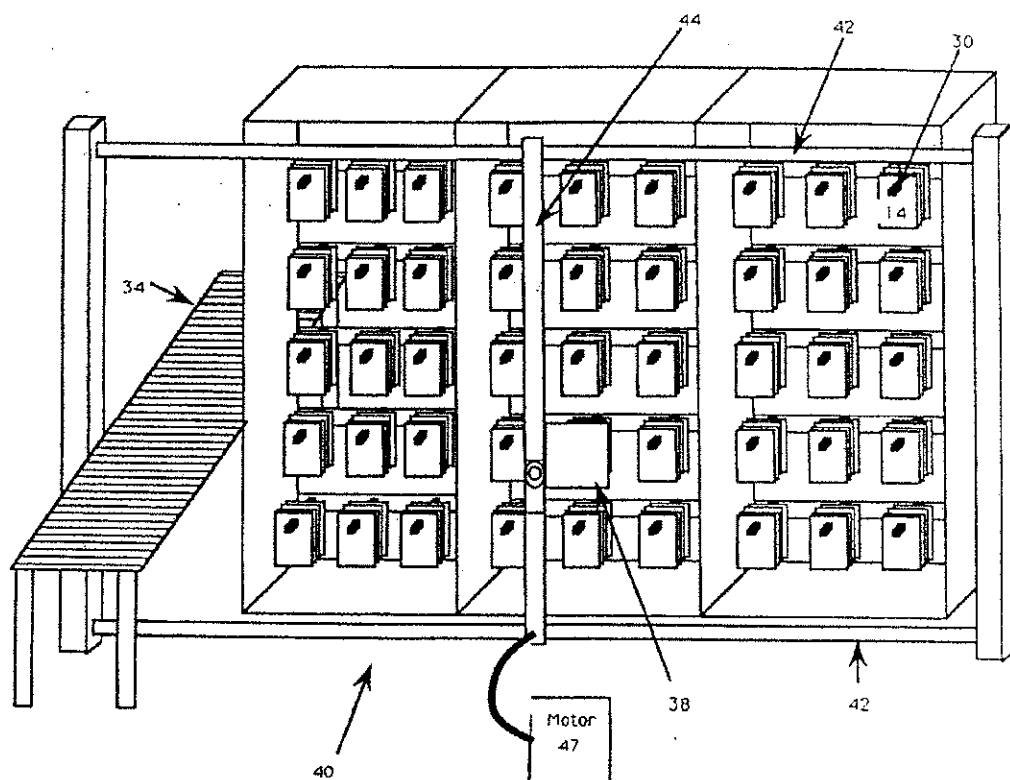


Figure 6

08/452646

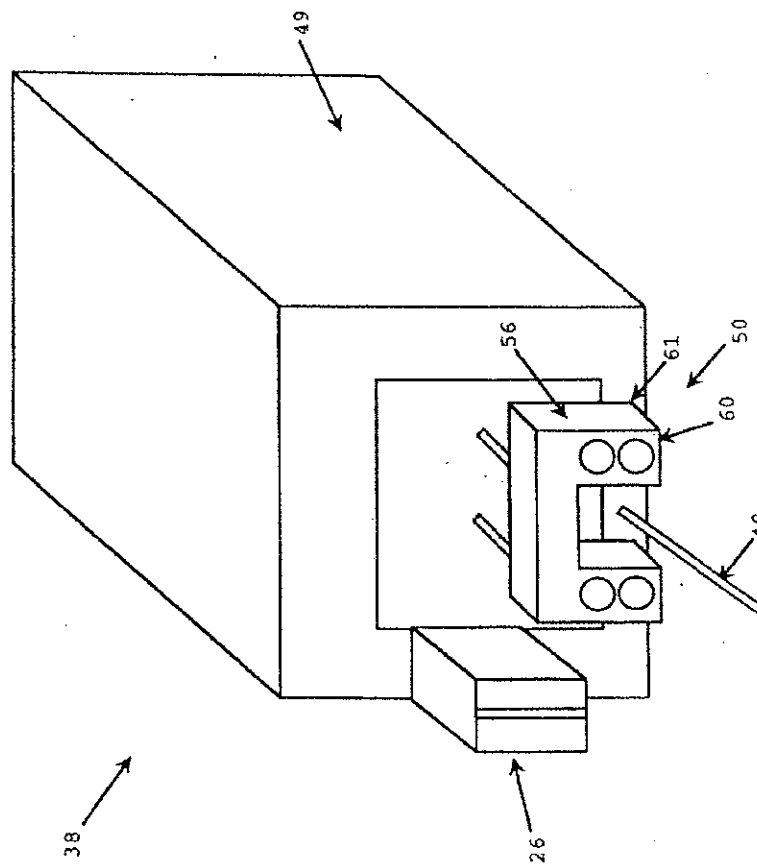
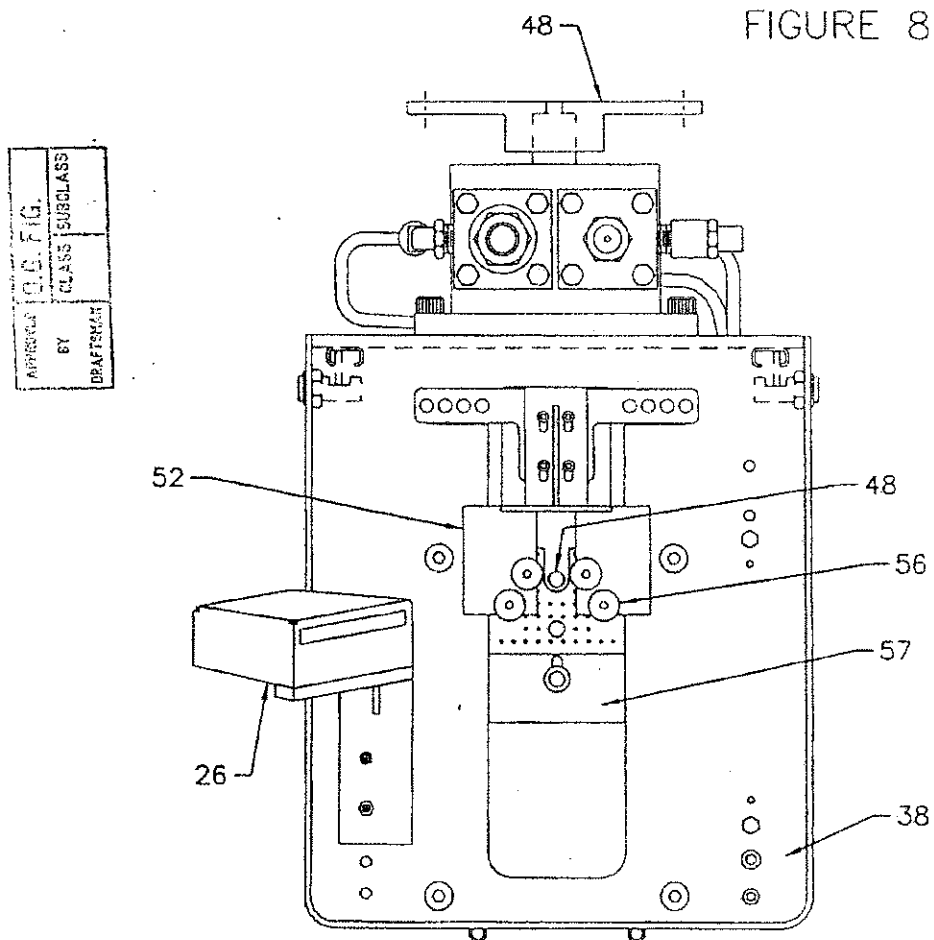


Figure 7

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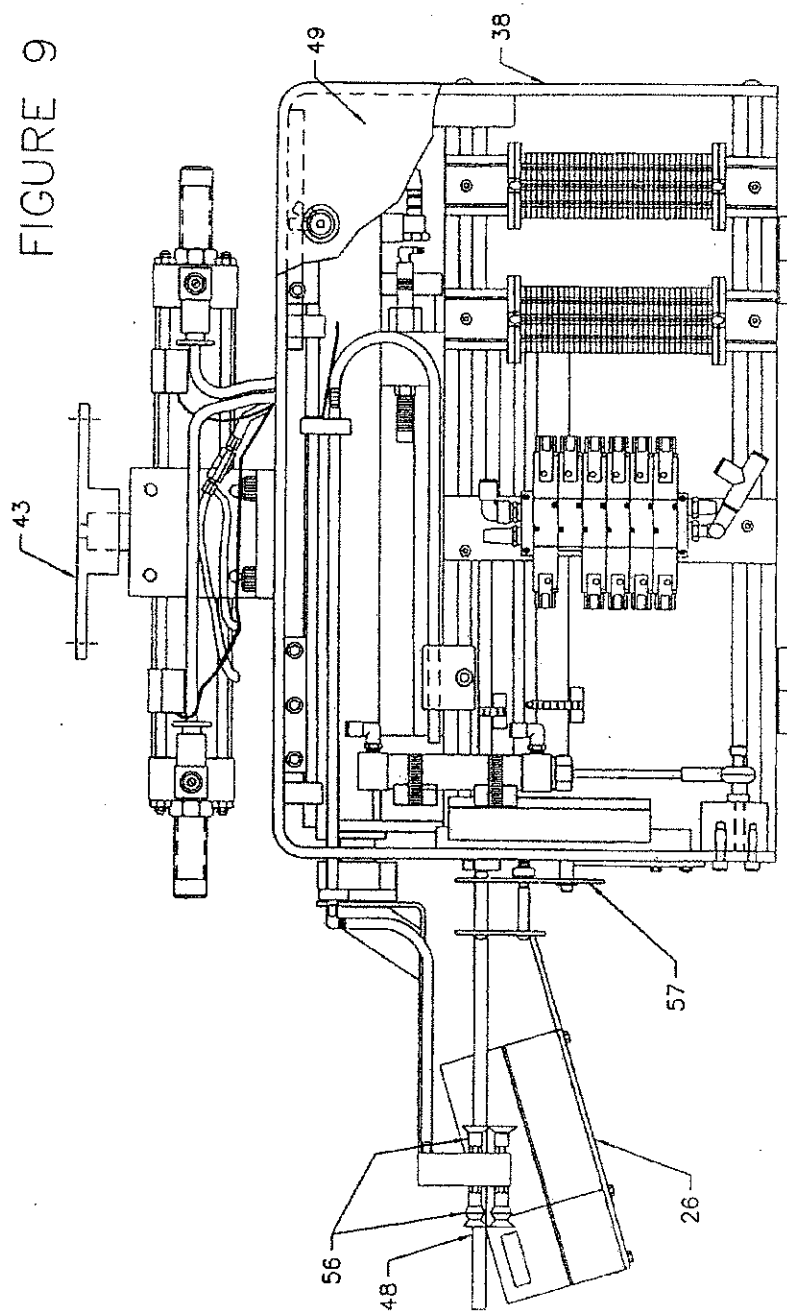
FIGURE 8



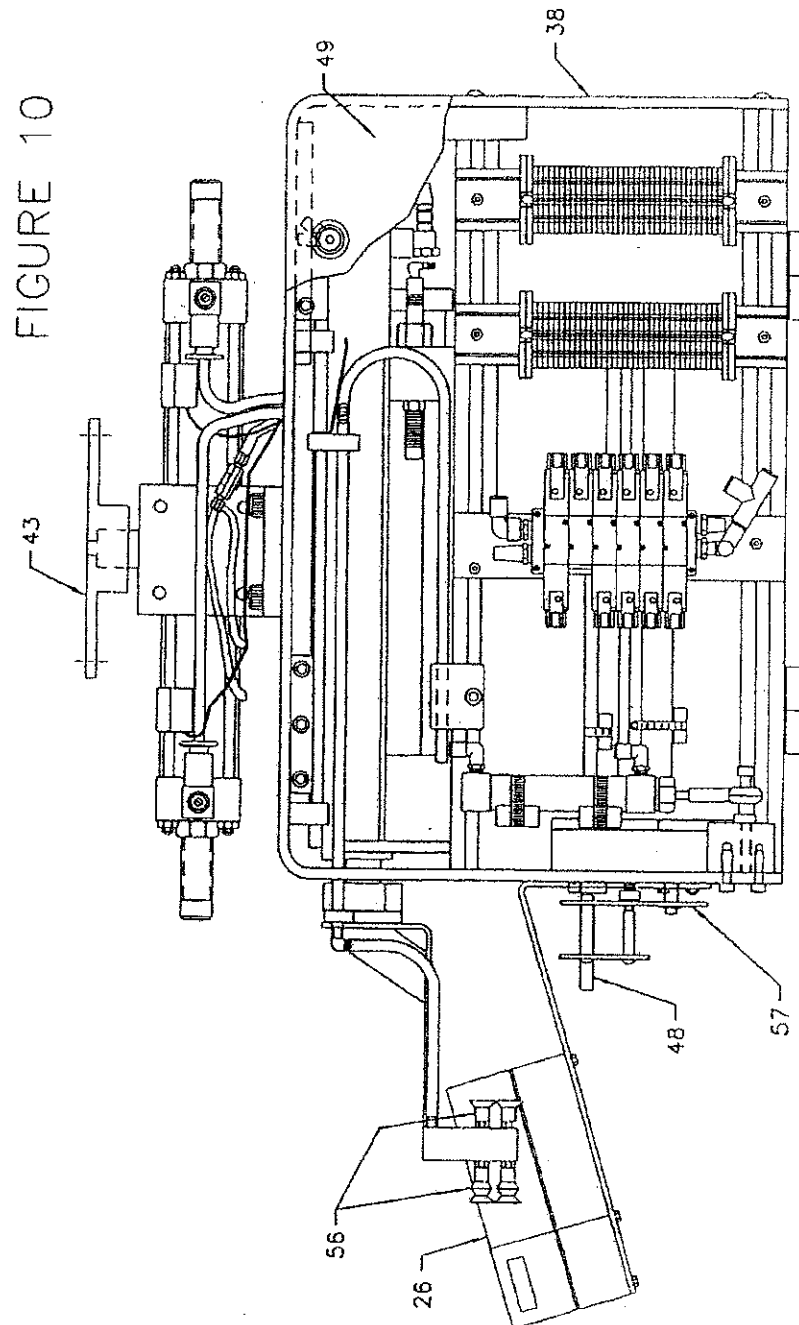
09/452646

APPROVED	06.FIG.
BY	CLASS SUBCLASS
DRAFTSMAN	

FIGURE 9



19/452646



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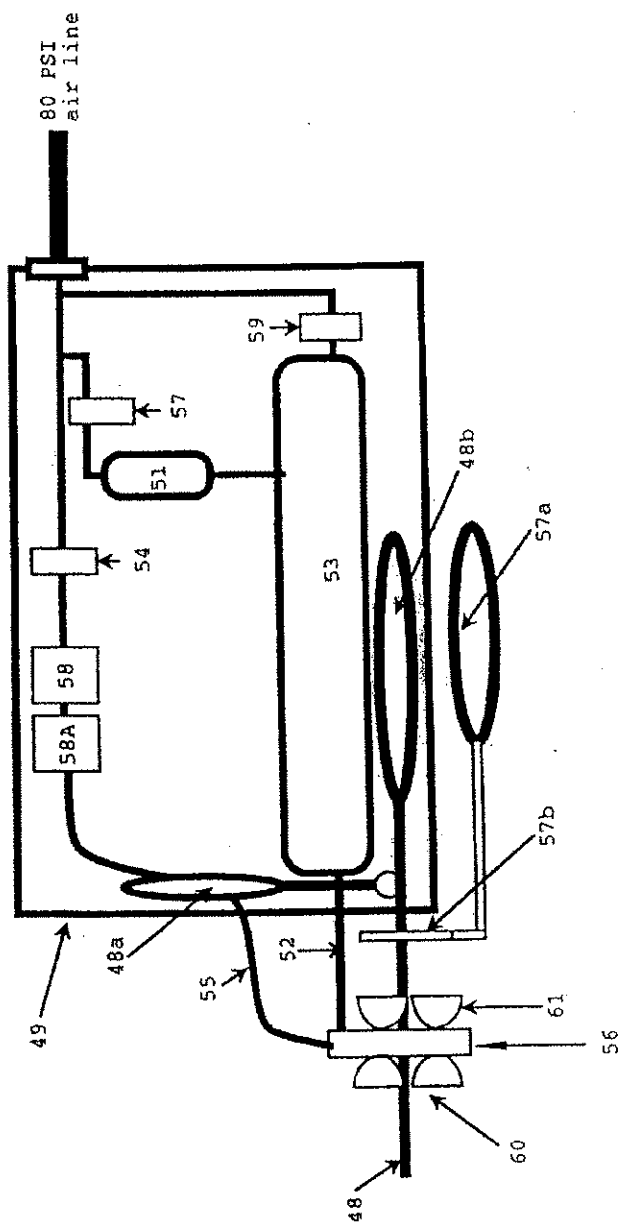


Figure 11

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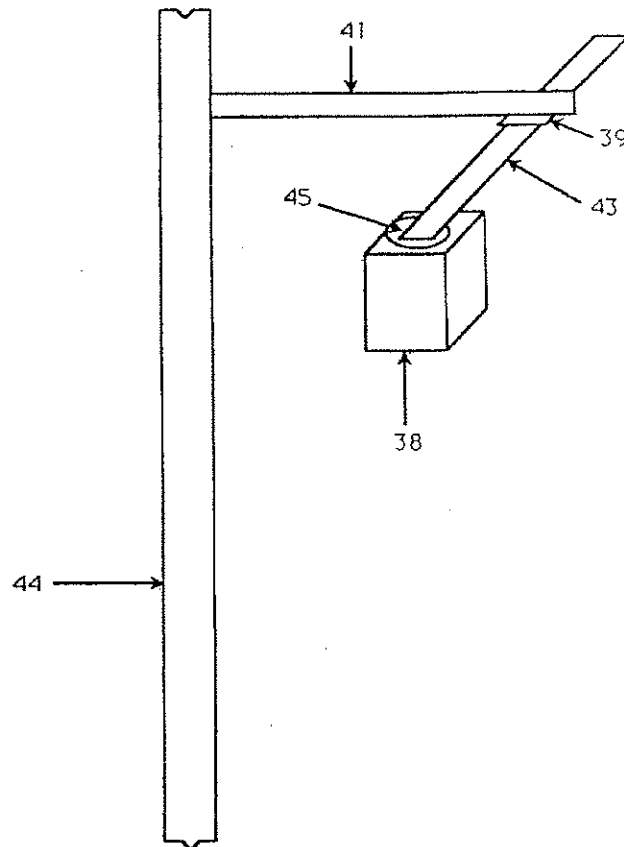
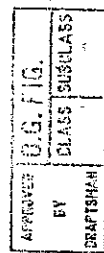


Figure 12

09/452646

APPENDIX	0.6. FIG.
BY	CLASS
DRAFTSMAN	SUBCLASS

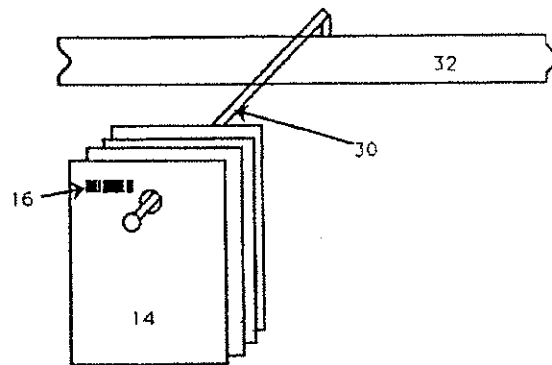


Figure 13

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APPENDIX	D.G. FIG.	
	BY	CLASS SUBCLASS
BRITISH		

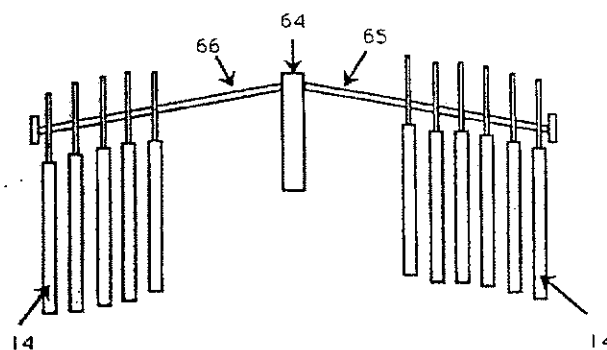


Figure 14

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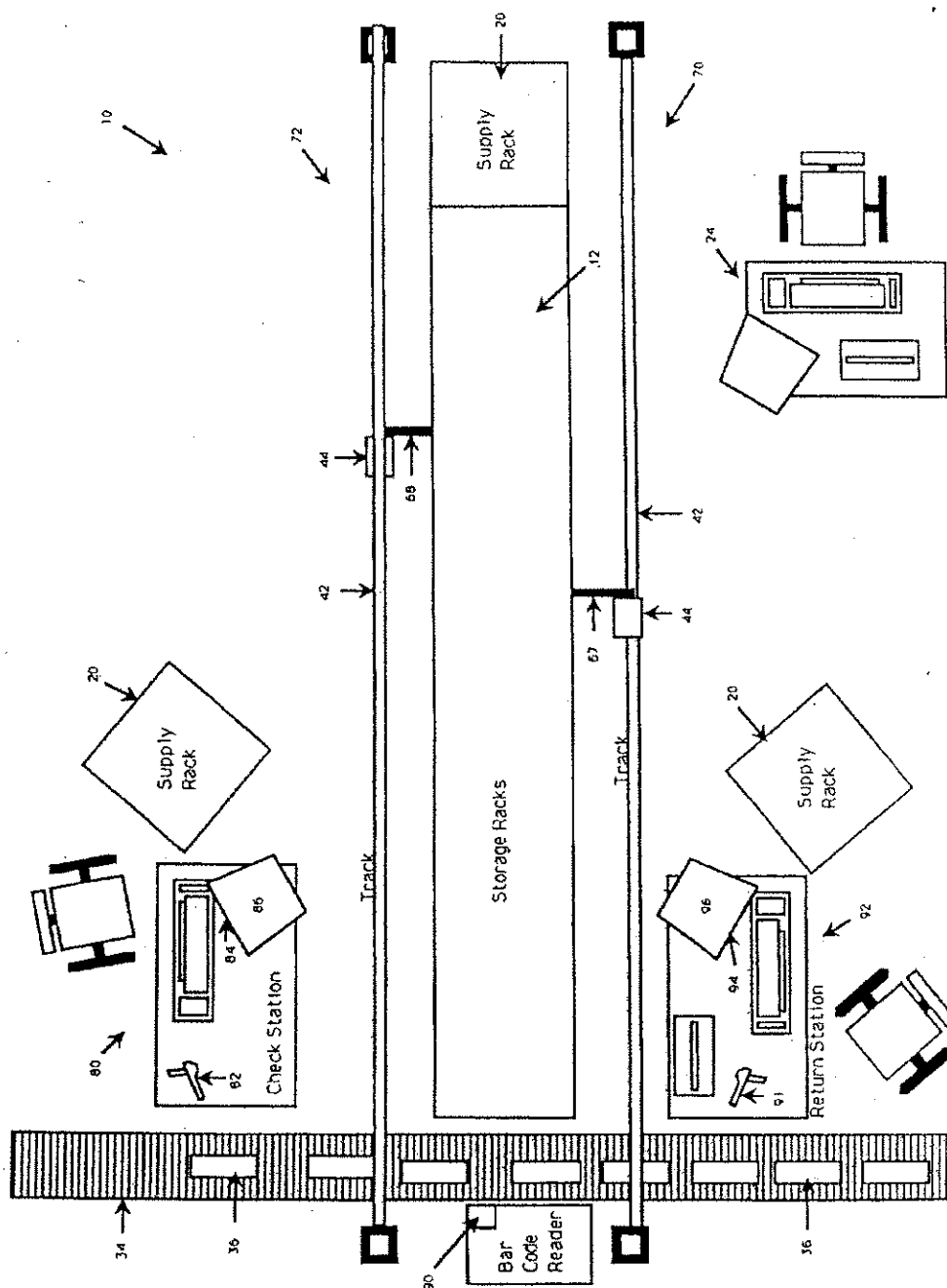
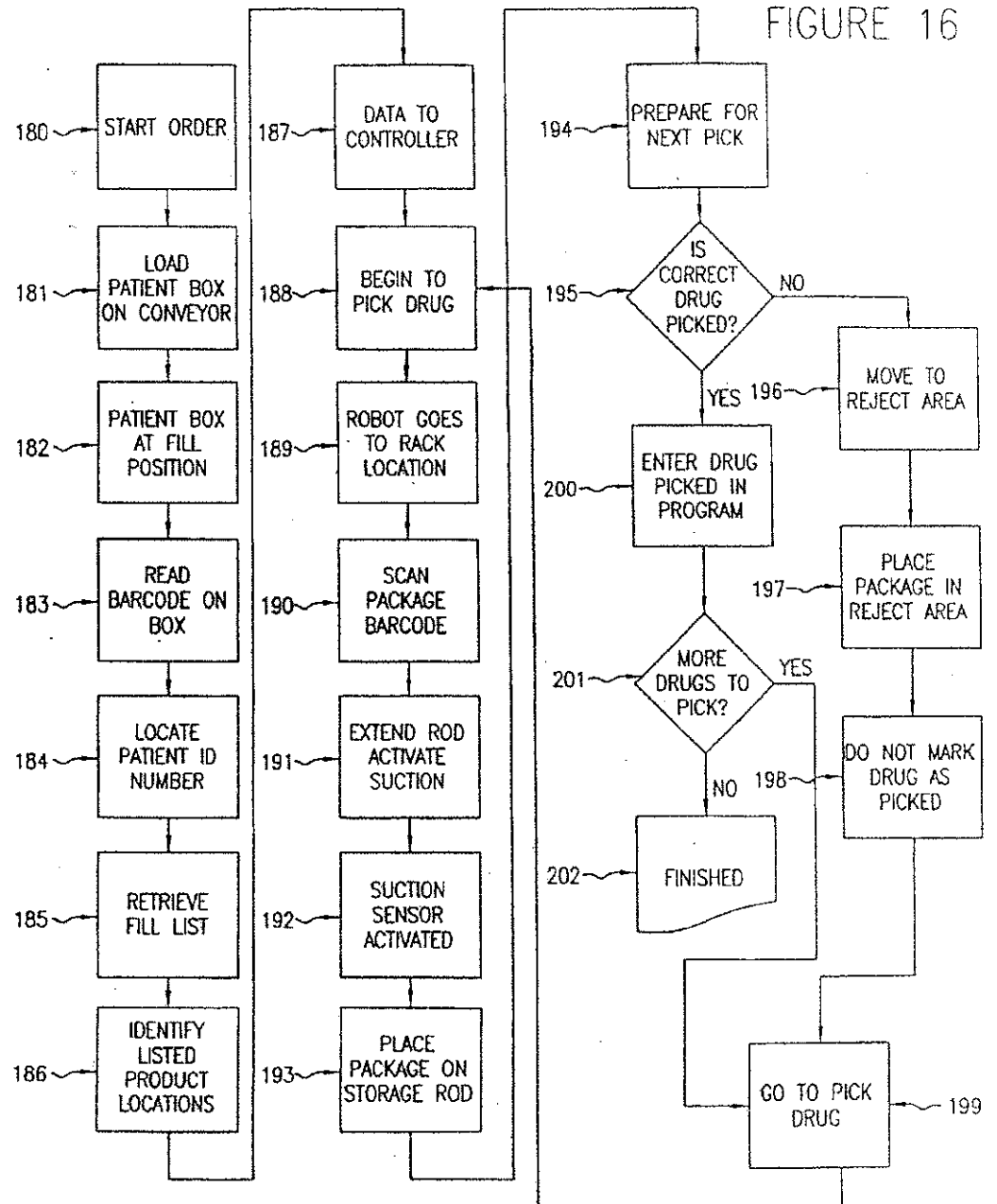


Figure 15

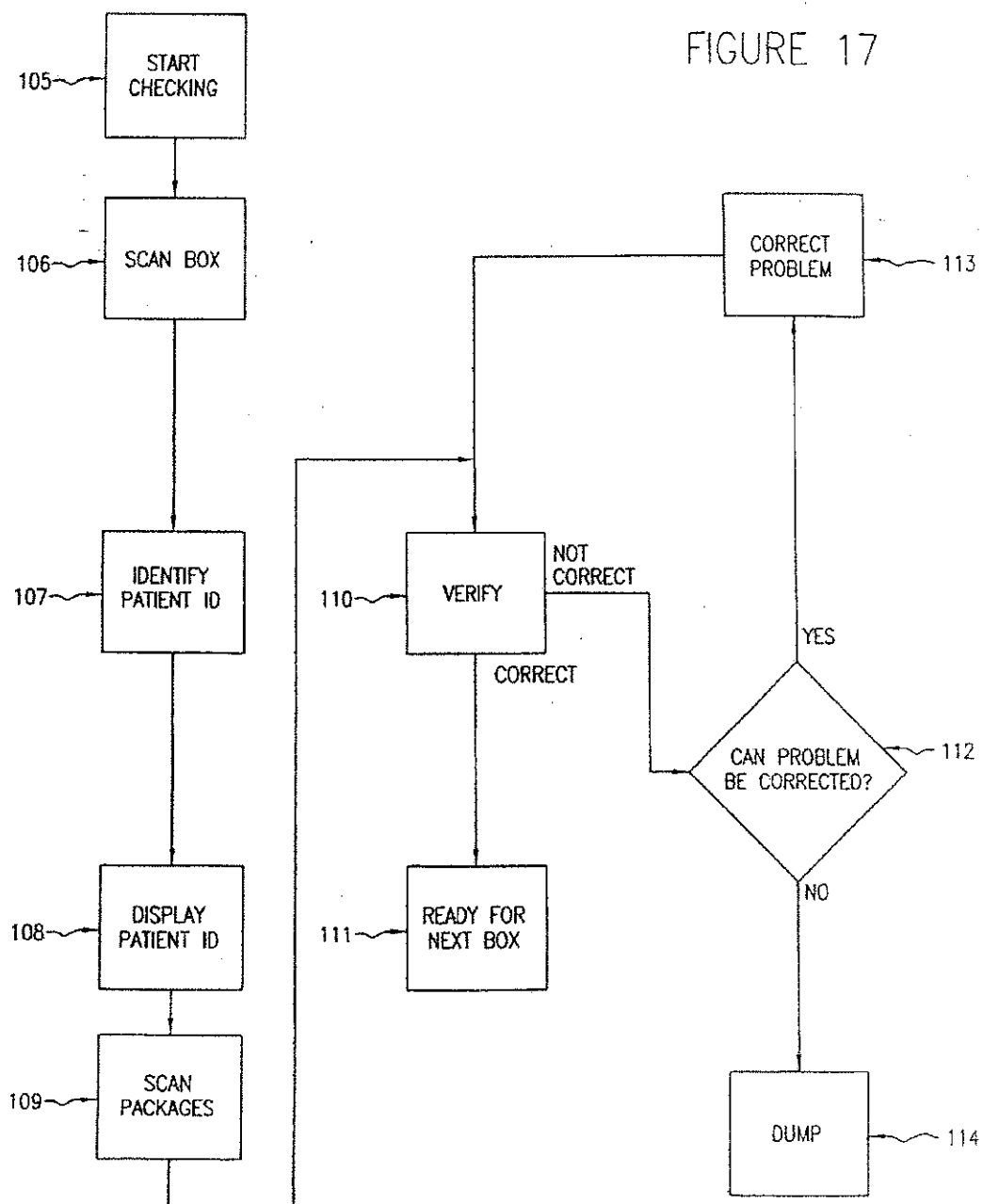
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FIGURE 16



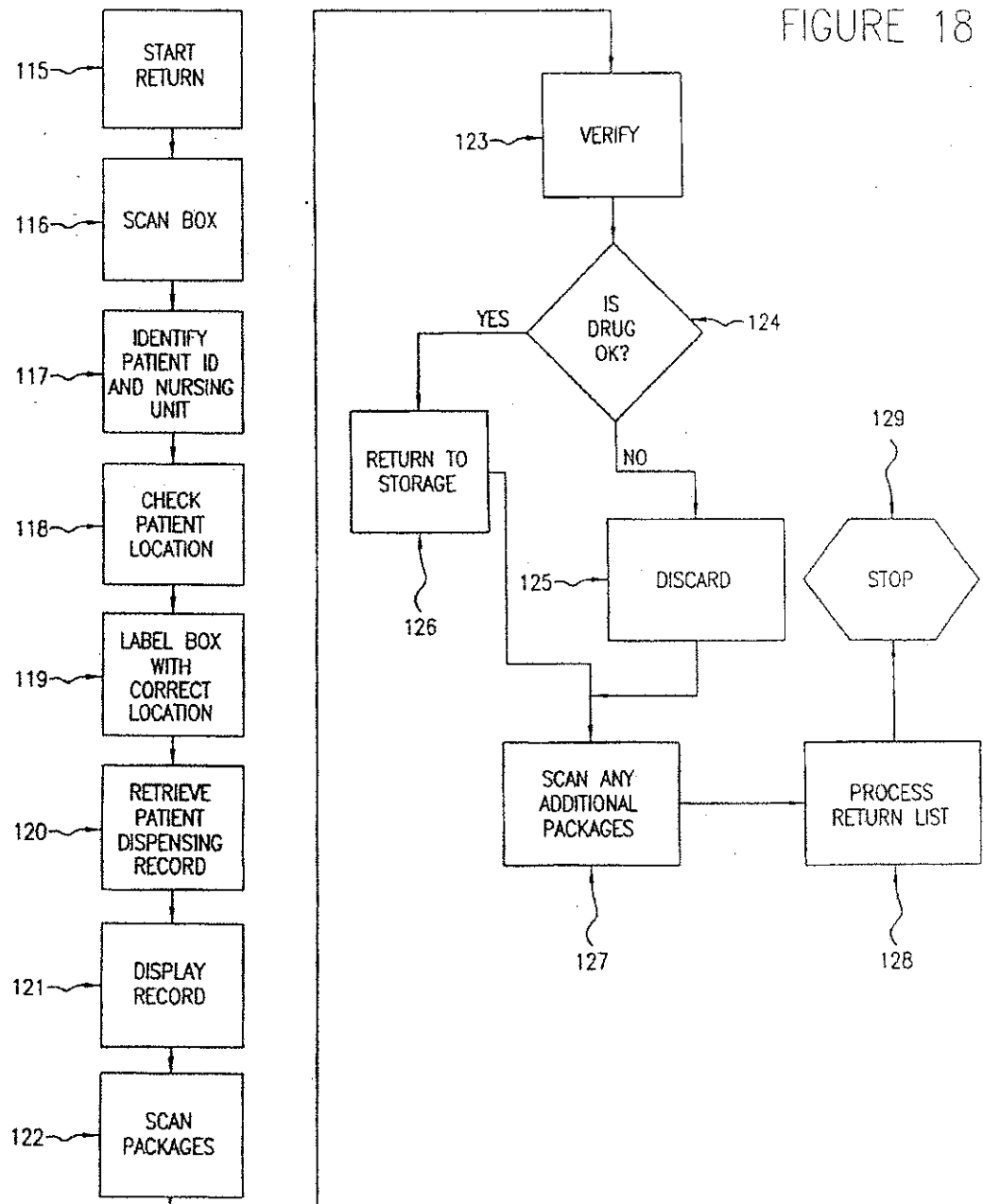
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FIGURE 17



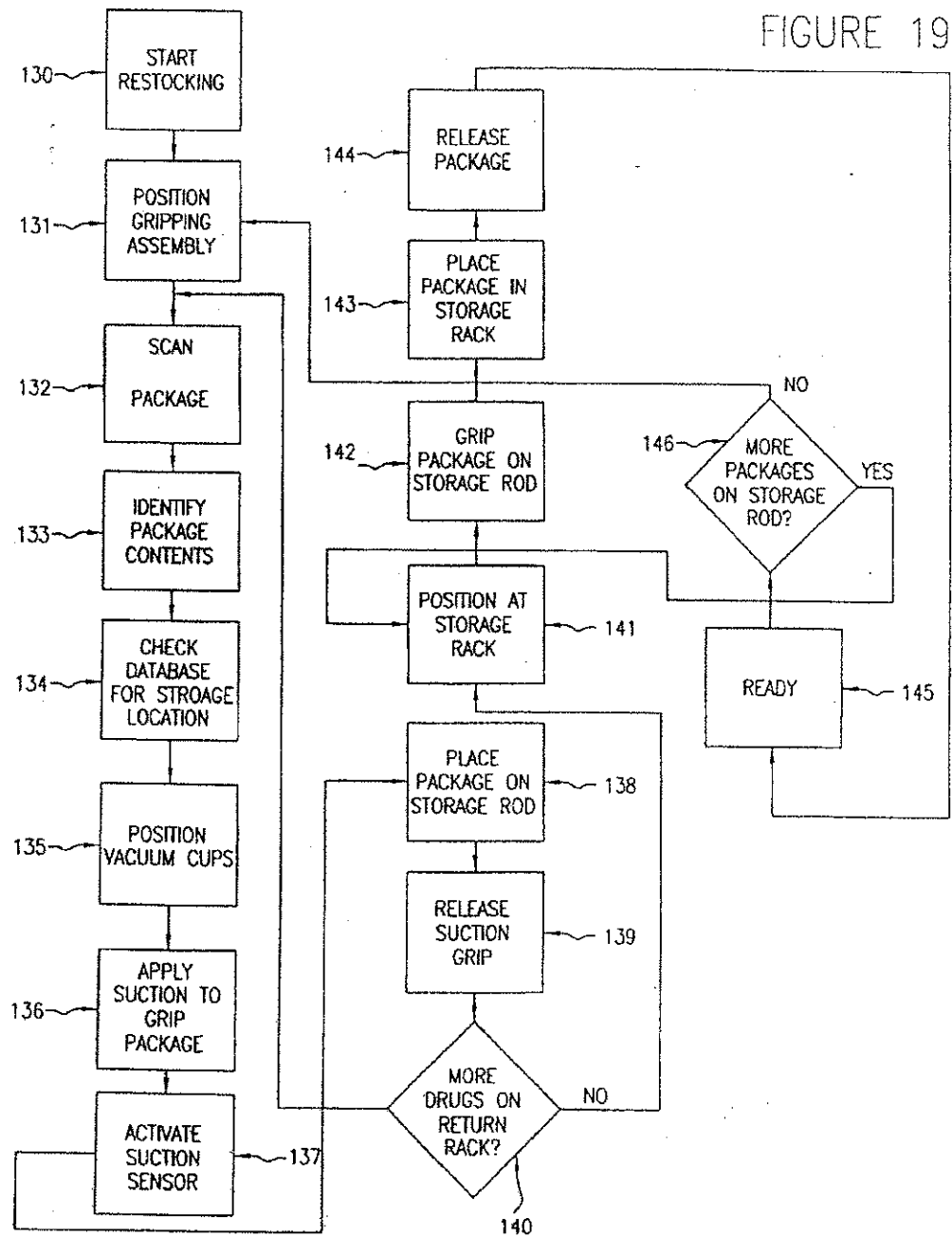
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FIGURE 18



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FIGURE 19



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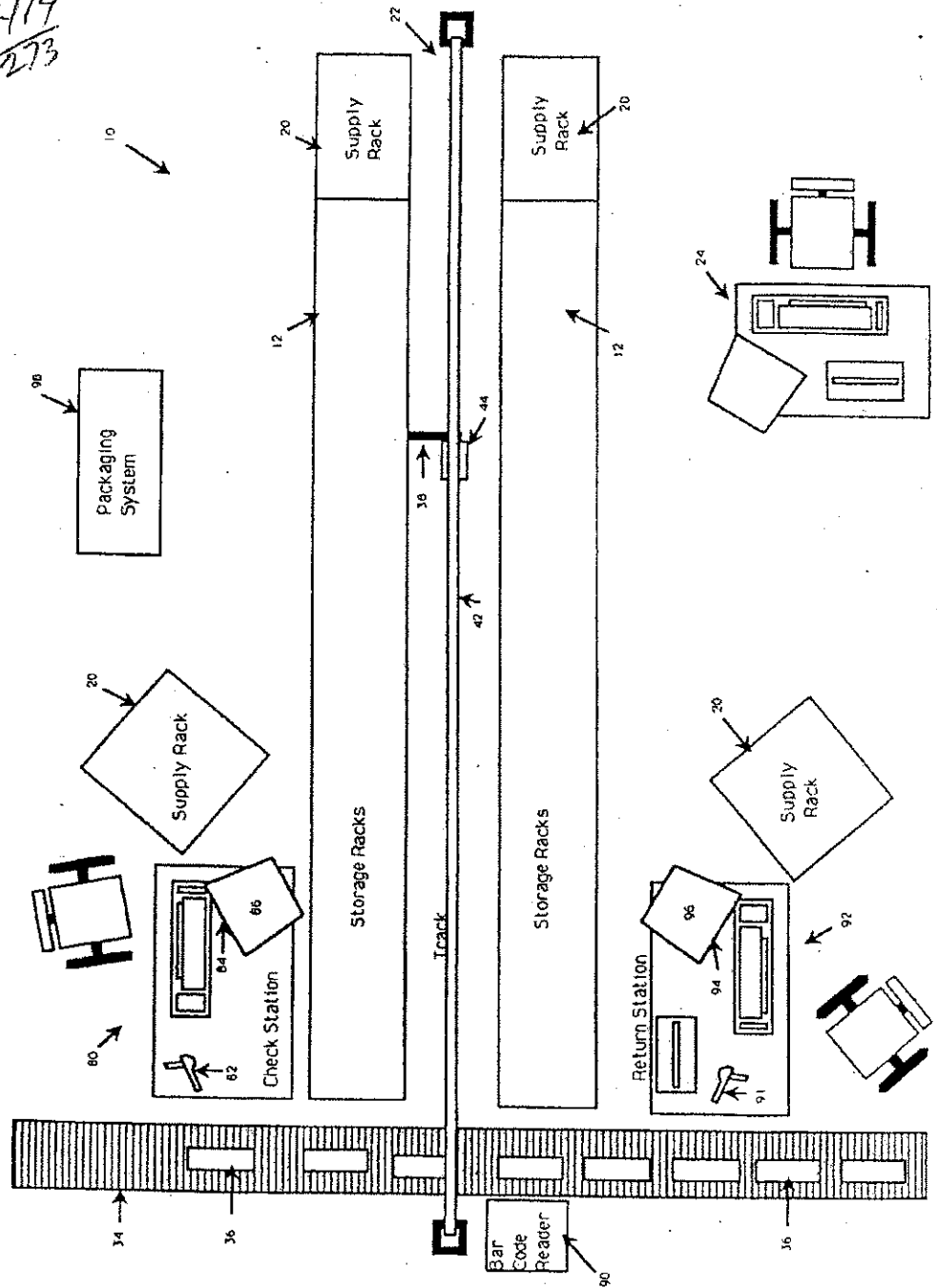


Figure 1

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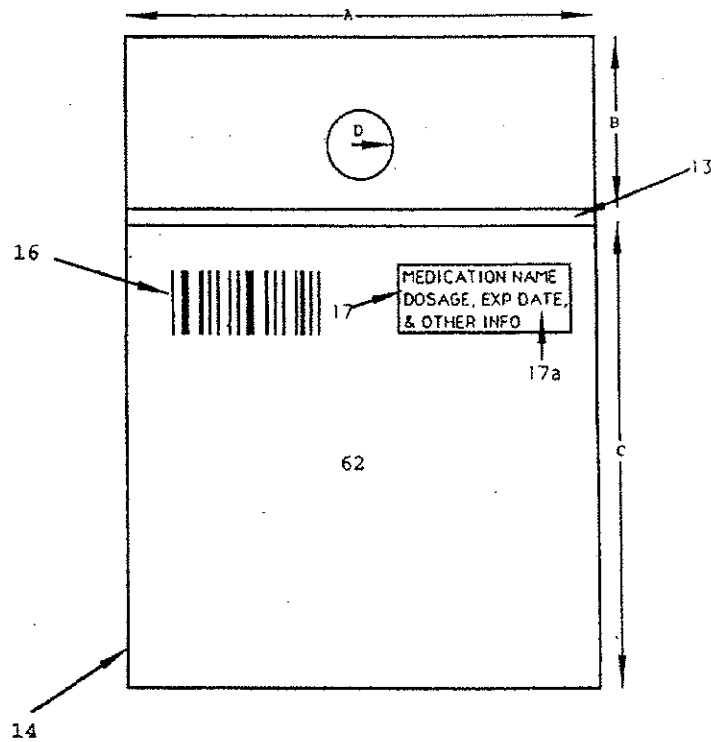


Figure 2

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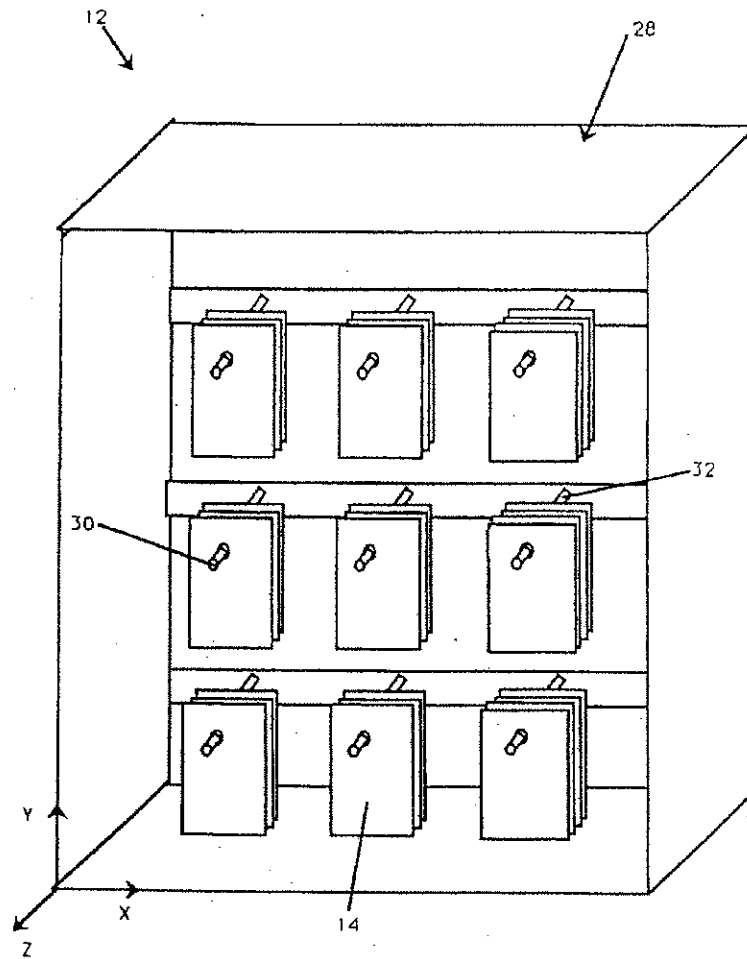


Figure 3

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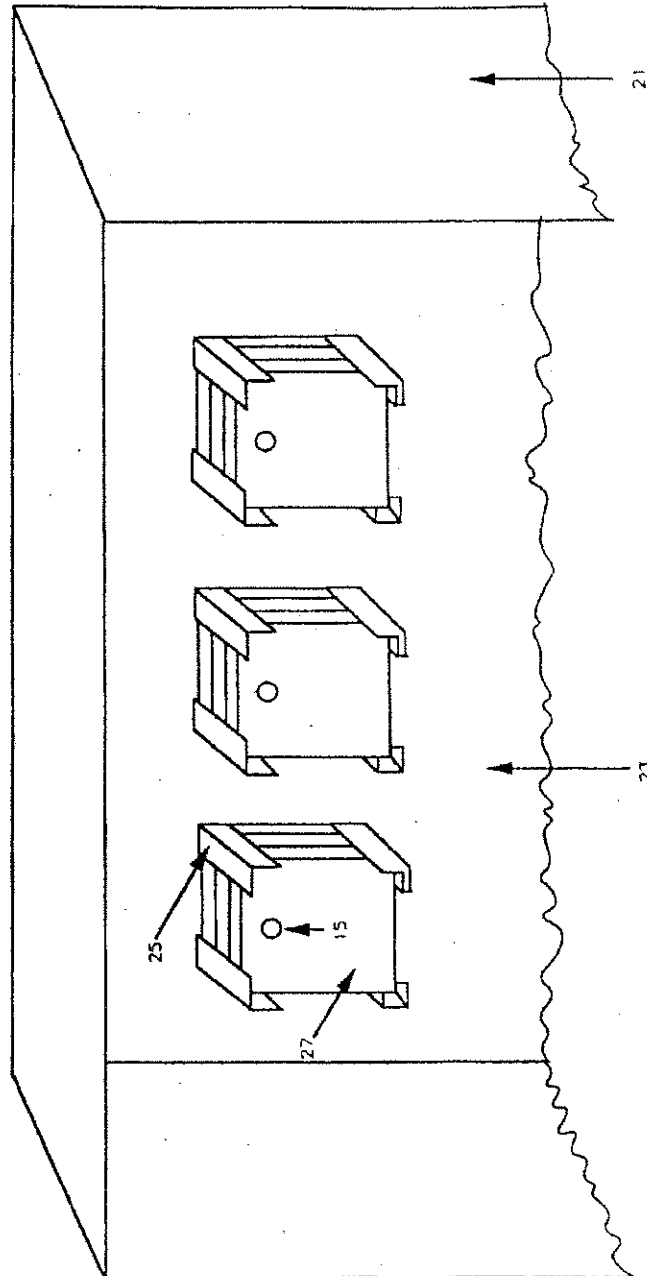


Figure 4

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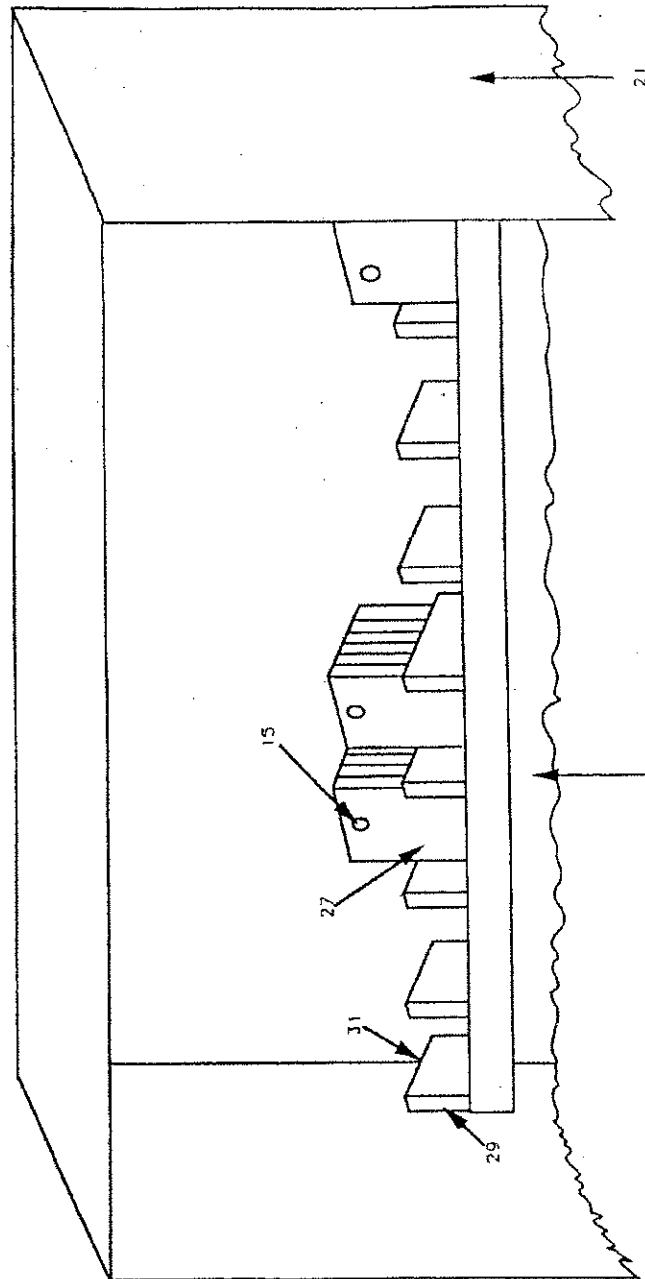


Figure 5

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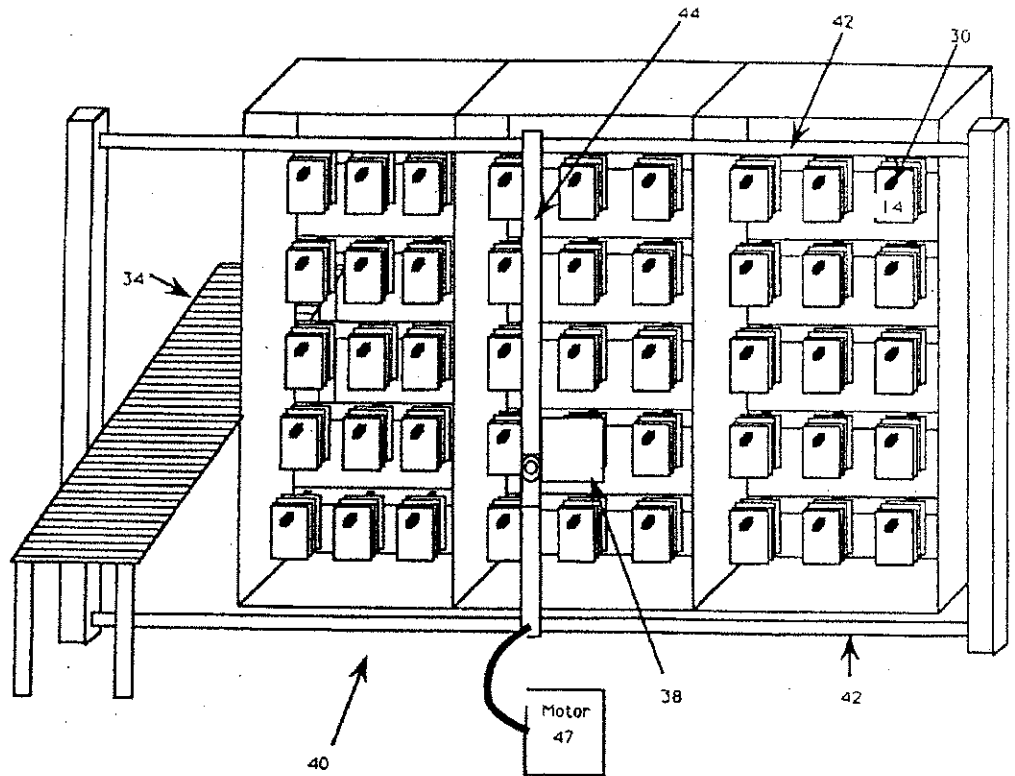


Figure 6

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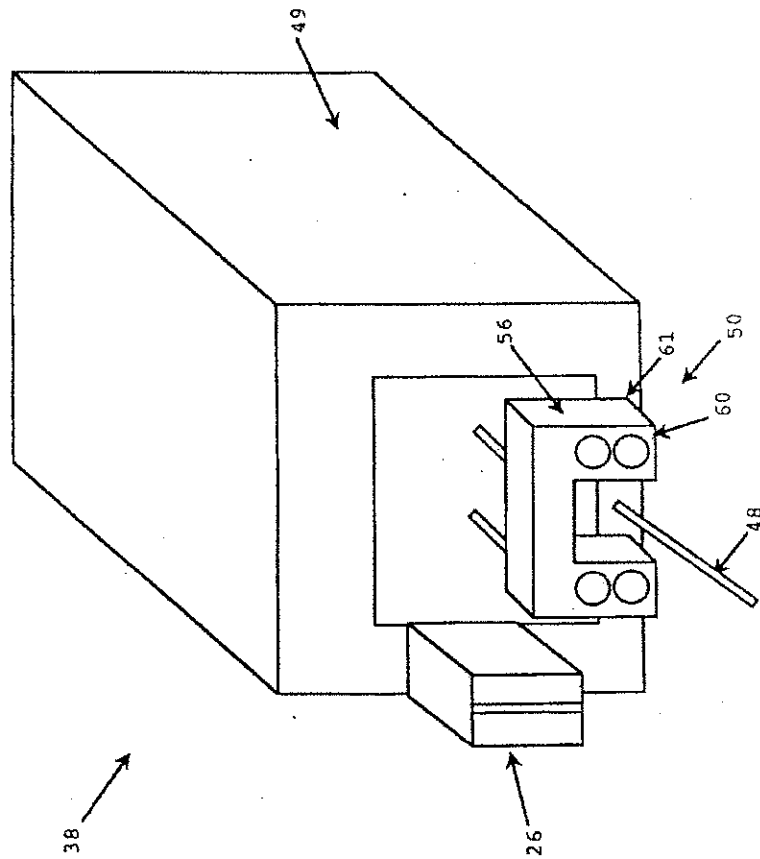
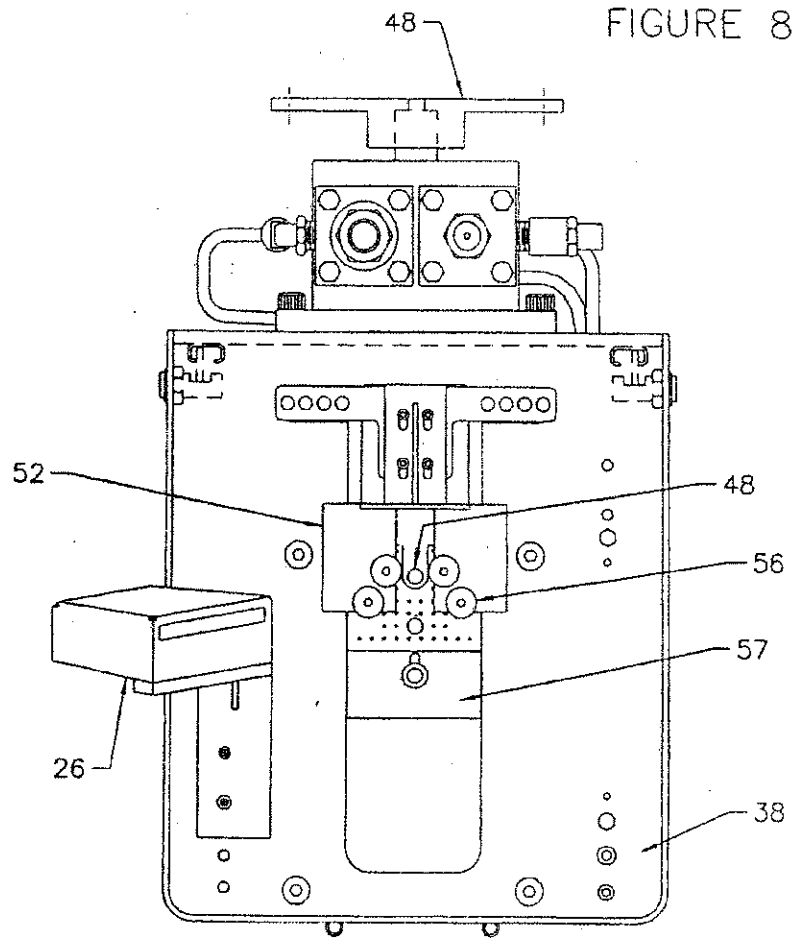


Figure 7

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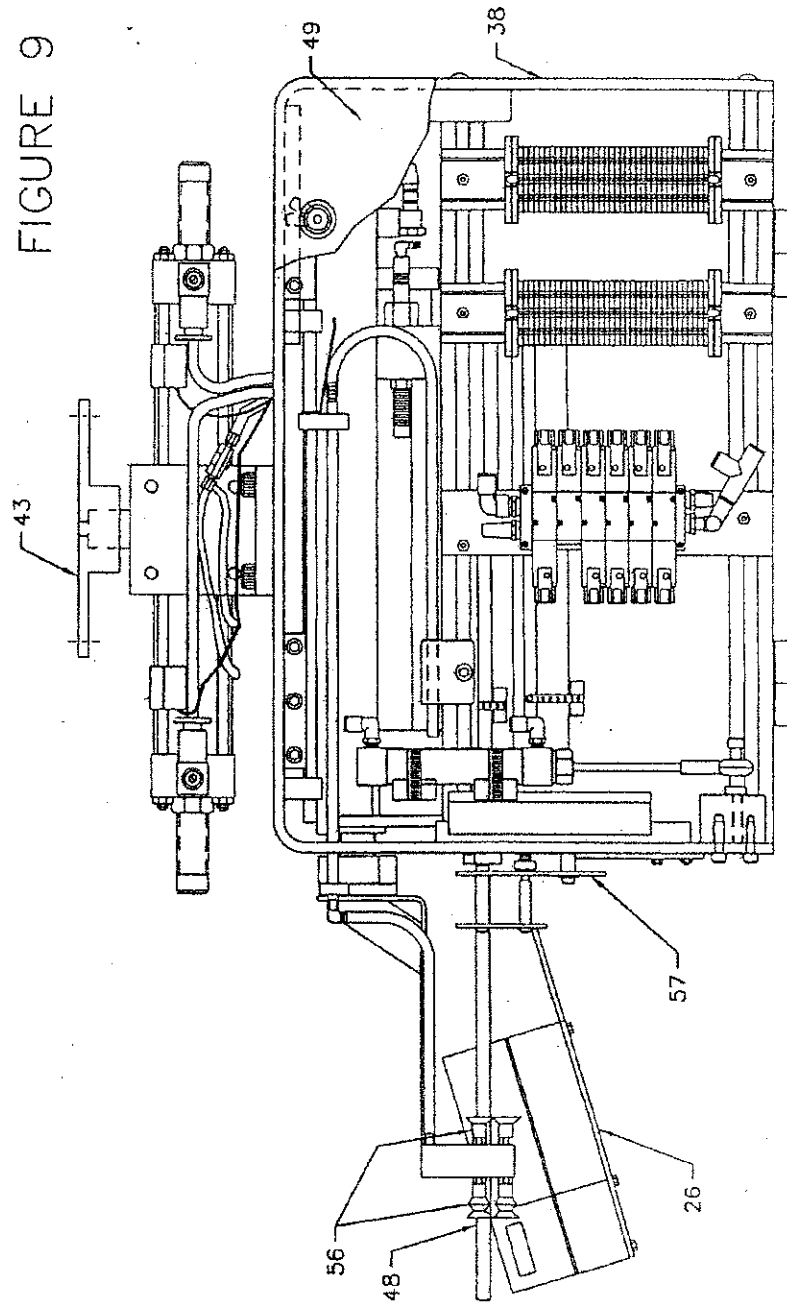
FIGURE 8



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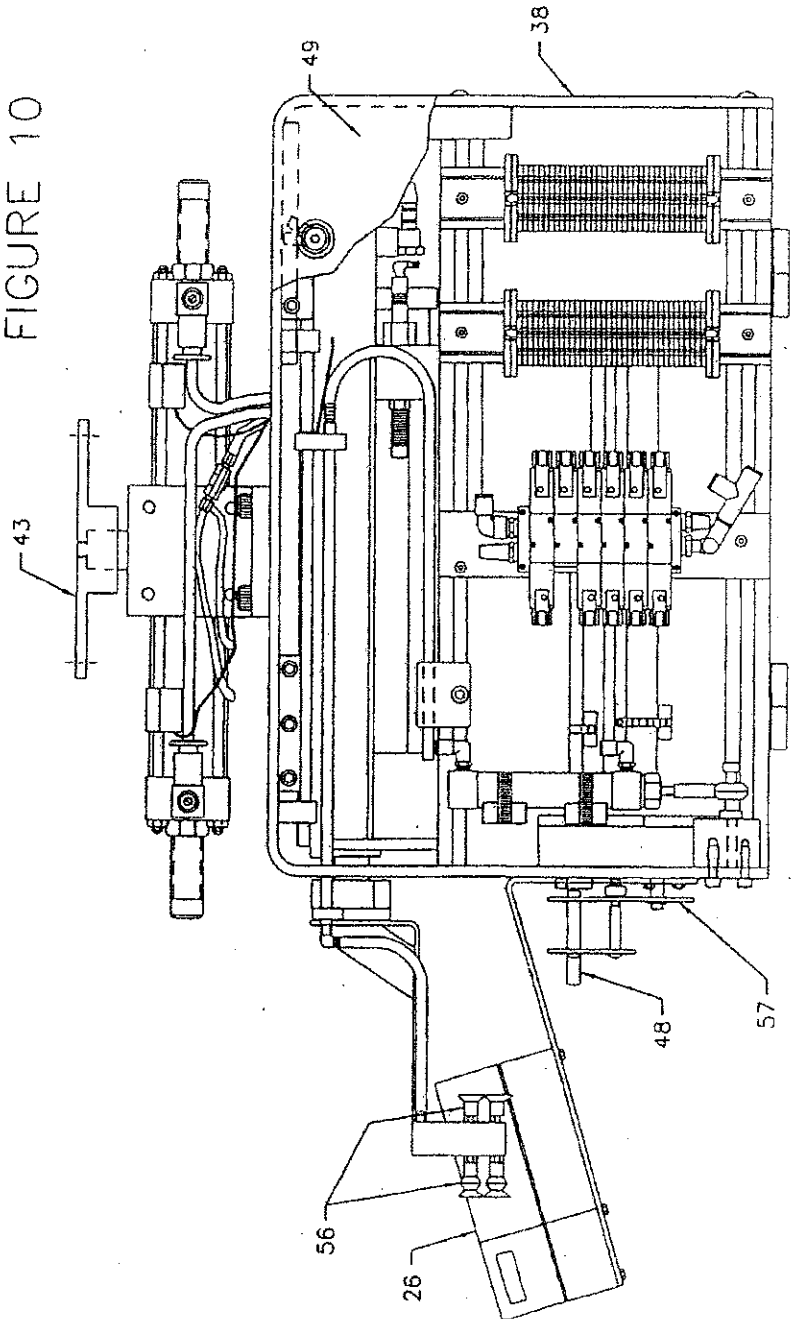
FIGURE 9



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FIGURE 10



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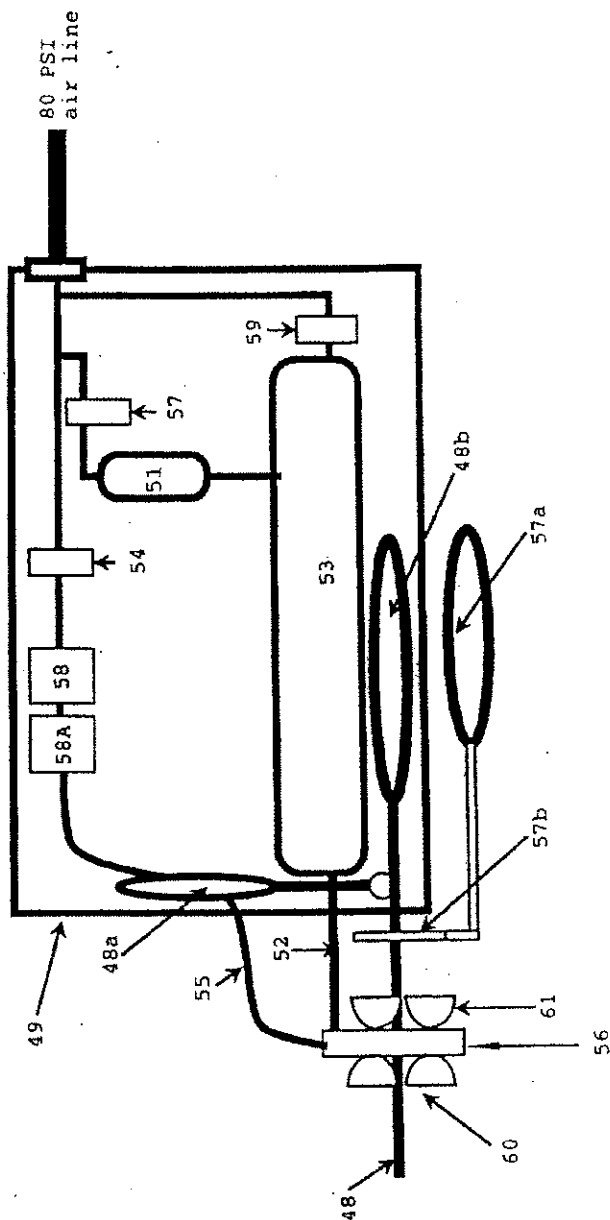


Figure 11

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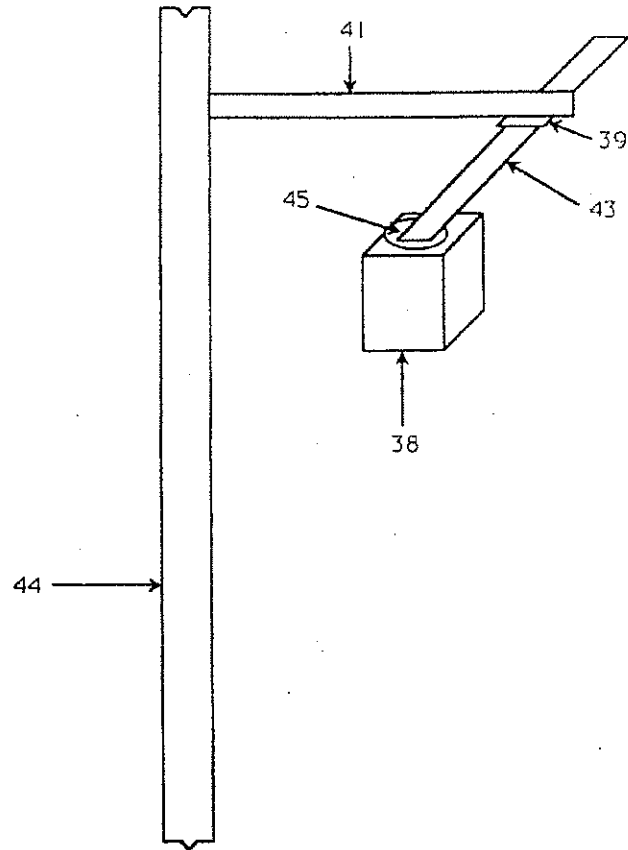


Figure 12

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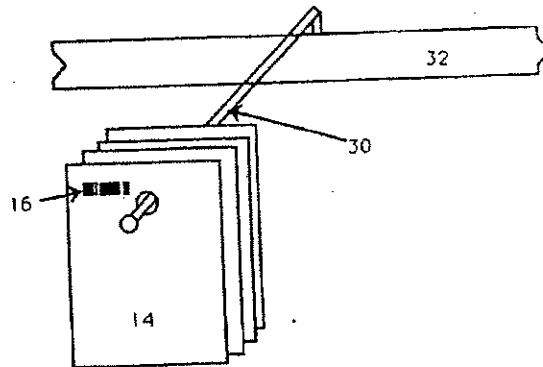


Figure 13

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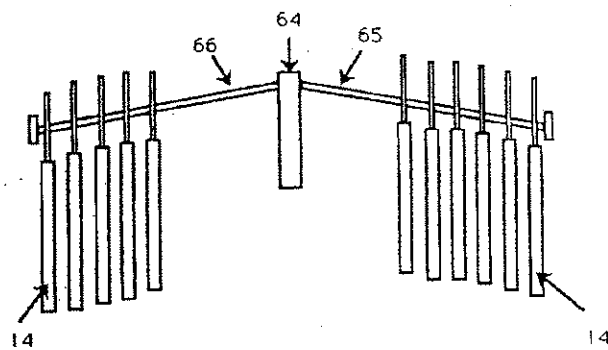


Figure 14

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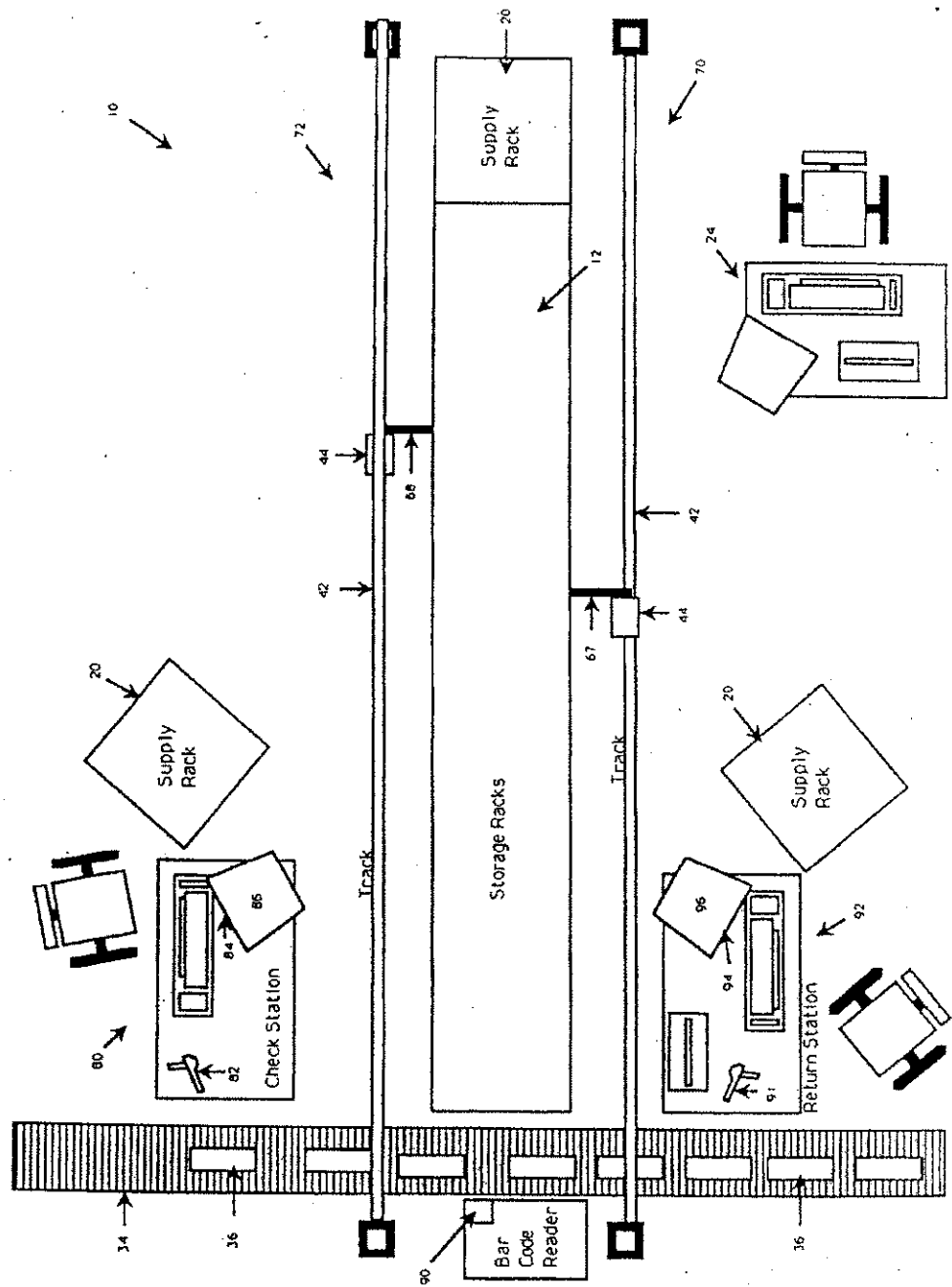
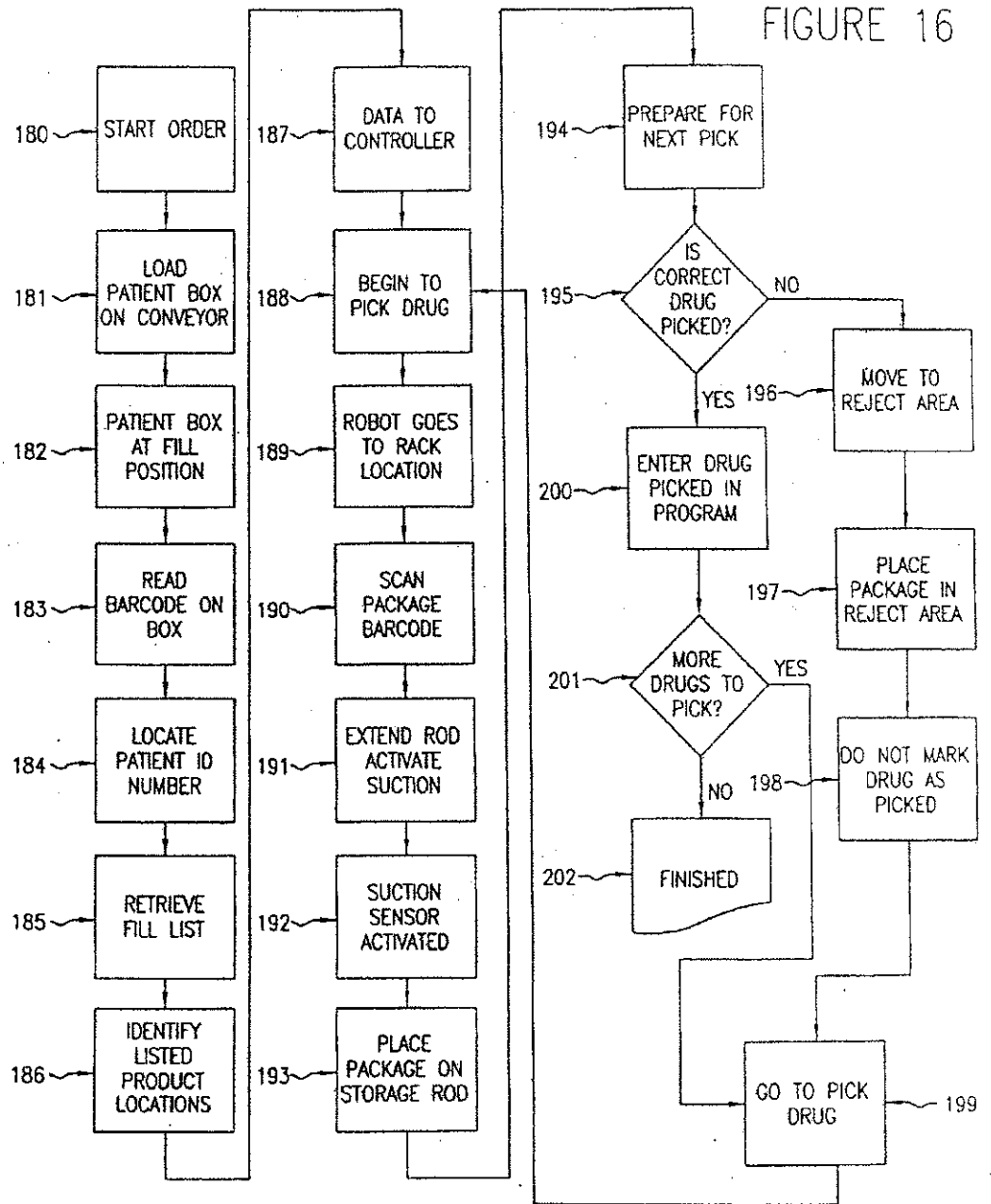


Figure 15

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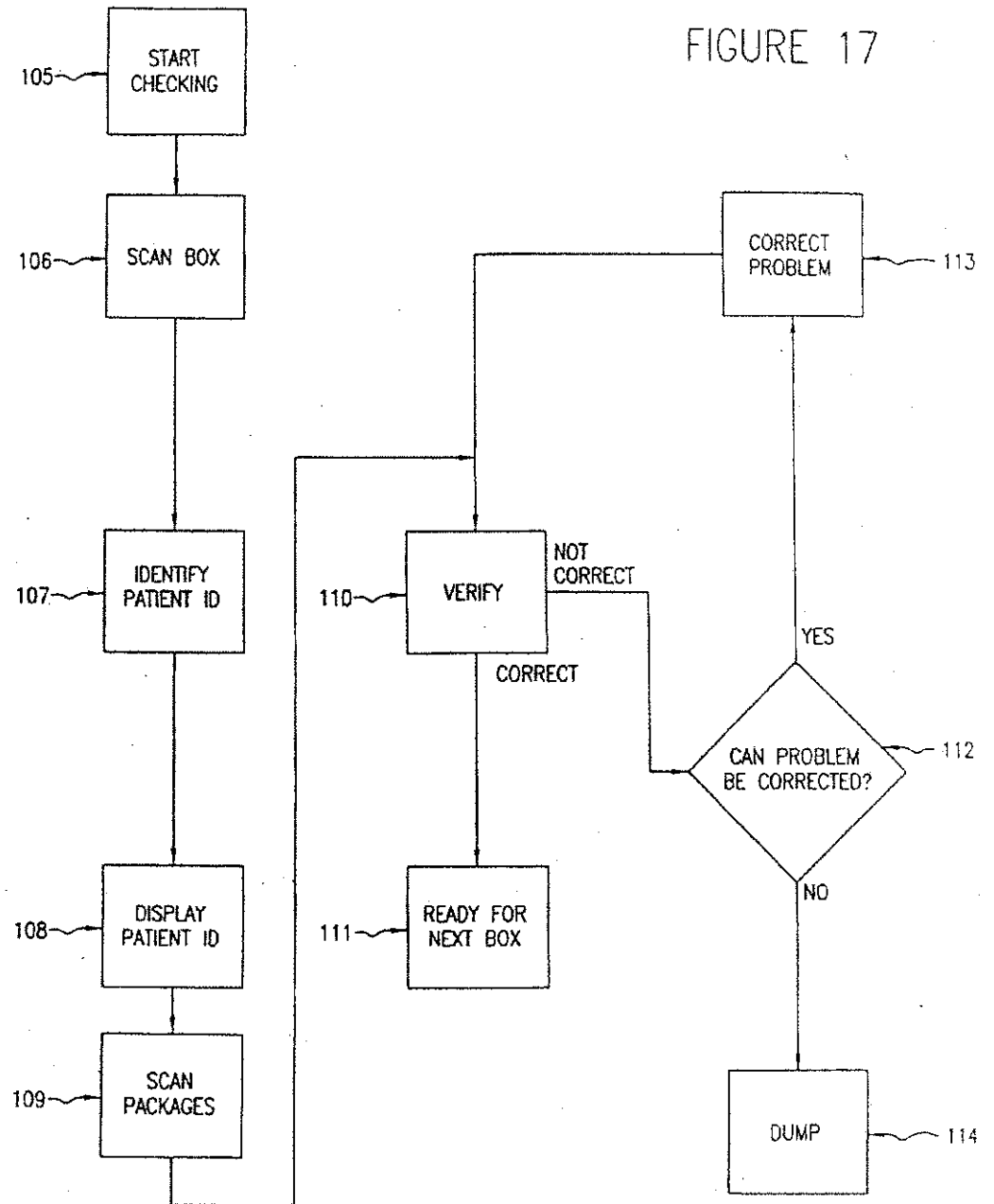
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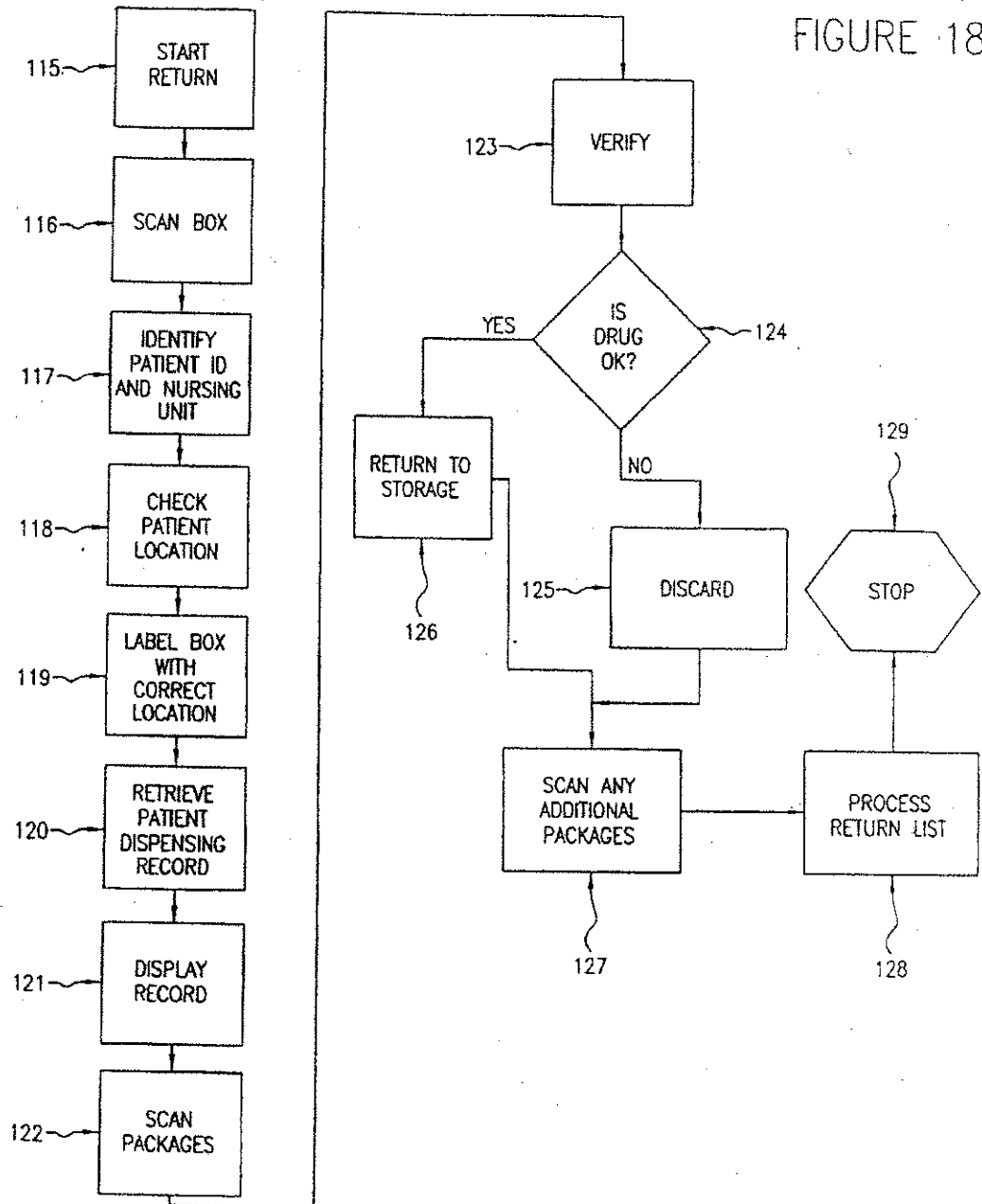
FIGURE 17



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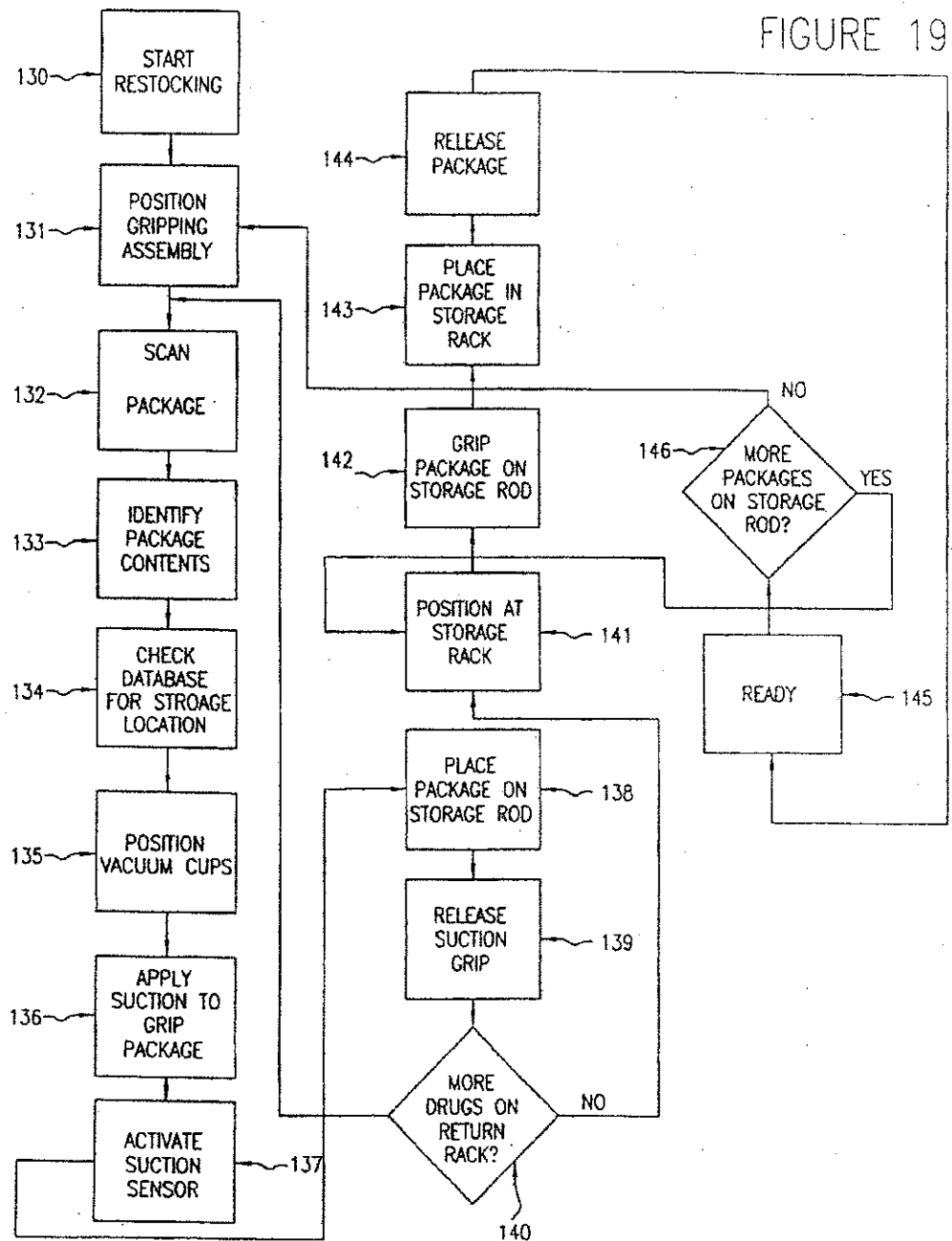
FIGURE 18



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FIGURE 19





PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit 3107

Examiner Frank E. Werner

In re application of

SEAN McDONALD et al.

: AN AUTOMATED SYSTEM
: FOR SELECTING PACKAGES
: FROM A STORAGE AREA

3107

#2
FOS
JW
7/29

INFORMATION DISCLOSURE STATEMENT

Pittsburgh, Pennsylvania 15219

May 25, 1995

Hon. Commissioner of Patents and Trademarks

Washington, D.C. 20231

Sir:

The most pertinent prior art known to applicants has been cited in the parent application Serial No. 07/871,832, filed April 21, 1992. Form PTO 1449 listing that prior art is attached hereto. Pursuant to 37 C.F.R. 1.98(d) no copy of these references are submitted herewith.

Respectfully submitted,

BUCHANAN INGERSOLL, P.C.

By Lynn J. Alstadt

Lynn J. Alstadt
Registration No. 29,362

Attorneys for Applicants

(412) 562-1632

MA000392

SHEET 1 OF 2

FORM PTO-1449 (Rev. 7-82)		U.S. Department of Commerce Patent and Trademark Office		ATTY DOCKET NO. 950441		SERIAL NO. 08/452646	
LIST OF PRIOR ART CITED BY APPLICANT (Use several sheets if necessary)				APPLICANT Sean McDonald et al.		FILING DATE 5-25-95	
				GROUP 3107		#	
U.S. PATENT DOCUMENTS							
EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	IF APPROPRIATE	
PW	AA	4,896,024	1/90	Morello et al.	414	274	
PW	AB	4,789,295	12/88	Boucher, Jr., et al.	414	280	
PW	AC	5,129,777	7/92	Pohjonen et al.	414	280	
PW	AD	4,812,629	3/89	O'Neil et al.	414	274	
PW	AE	4,546,901	10/85	Butarazzi	414	280	
PW	AF	4,786,229	11/88	Henderson	414	273	
PW	AG	4,792,270	12/88	Yoshida	414	273	
PW	AH	4,669,047	5/87	Chucta	414	331	
PW	AI	4,820,109	4/89	Witt	414	282	
PW	AJ	4,651,863	3/87	Reuter et al.	414	280	
PW	AK	3,802,580	4/74	Castaldi	414	280	
FOREIGN PATENT DOCUMENTS							
	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES NO	
PW	AL	304	1/79	PCT	414	273	✓
	AM						
	AN						
	AO						
	AP						
OTHER PRIOR ART (including Author, Title, Date, Paragraph, Page, Etc.)							
	AR						
	AS						
	AT						
EXAMINER P.E. Werner				DATE CONSIDERED 8/95			
* EXAMINER: Initial if reference considered, whether or not citation is in conformance with PEP 602. Draw line through question if not in conformance and not considered. Include copy of this form with next communication to applicant.							

SHEET 2 of 2

FORM PTO-1449 (Rev. 7-80)		U.S. Department of Commerce Patent and Trademark Office		ATTY DOCKET NO. 950441		SERIAL NO. 08/452646	
LIST OF PRIOR ART CITED BY APPLICANT (Use several sheets if necessary)				APPLICANT Sean McDonald et al.			
				FILING DATE 5-25-95		GROUP 3107	
U.S. PATENT DOCUMENTS							
EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	IF APPLICABLE
PW	AA	3,986,612	10/76	Kamm et al.	209	111.7	
PW	AB	4,672,390	7/87	Bonneton et al.	414	282	
	AC						
	AD						
	AE						
	AF						
	AG						
	AH						
	AI						
	AJ						
	AK						
FOREIGN PATENT DOCUMENTS							
		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES NO
PW	AL	2 596 299	10/87	French	-	-	✓
PW	AM	FR85/00232	8/84	PCT	-	-	✓
	AN						
	AO						
	AP						
OTHER PRIOR ART (including Author, Title, Date, Pertinent Pages, Etc.)							
	AR						
	AS						
	AT						
EXAMINER F.E. Werner				DATE CONSIDERED 8/95			
* EXAMINER: Initial if reference considered, whether or not citation is in conformance with PEP 800. Draw line through question if not in conformance and not considered. Include copy of this form with next communication to applicant.							

414-273

AUJ 314 47901

EP 0000304
JAN 1979

HOTC- ★ Q35 A2971B/02 ★ EP ---304 ✓
Sorting machine for e.g. small hardware kits - has reader delivering
signals to logic control circuits which route items between transfer
and receiving rails
HOTCHKISS-BRANDT 05.07.77-FR-020658
P43 (10.01.79) B07c-03/08 B65g-47/61
D/S: DT, GB, SW,

The sorting machine has a storage rail which receives objects from work stations, suspension hooks being driven by a transfer device. A gripper supports each object for attachment to a hook, an unhooking device disengaging each gripper from its hook so that the objects can be attached to respective receiving rails.

The hooks and receiving rails are pref. mounted at different levels, a guide element maintaining the grippers in position during transfer. The machine pref. includes a reader which is responsive to index markings on the objects to control their transfer to the receiving rails.

The machine may be used to sort high turnover hardware items, partic. those consisting of several small components. It may also be adopted for use in an automatic document retrieval system.

16.6.78 as 400023 (25pp934).

ISR: DT1265044; DT1251236; FR2040483; FR1541475;
FR1334995; US3572546; US2998136.


UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

 Address: COMMISSIONER OF PATENTS AND TRADEMARKS
 Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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08/452,646 05/25/95 McDONALD

S 950441

EXAMINER

F1M1/0821

ART UNIT PAPER NUMBER

3107

DATE MAILED: 08/21/95

 LYNN J ALSTADT
 BUCHANAN INGERSOLL
 56TH FLOOR
 600 GRANT STREET
 PITTSBURGH PA 15219

 This is a communication from the examiner in charge of your application.
 COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☐ Responsive to communication filed on _____ ☐ This action is made final.

 A shortened statutory period for response to this action is set to expire 3 month(s), _____ day(s) from the date of this letter.
 Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- | | |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited by Examiner, PTO-892. | 2. <input checked="" type="checkbox"/> Notice of Draftsman's Patent Drawing Review, PTO-948. |
| 3. <input checked="" type="checkbox"/> Notice of Art Cited by Applicant, PTO-1449. | 4. <input type="checkbox"/> Notice of Informal Patent Application, PTO-152. |
| 5. <input type="checkbox"/> Information on How to Effect Drawing Changes, PTO-1474. | 6. <input type="checkbox"/> _____ |

Part II SUMMARY OF ACTION

1. ☒ Claims 24-35 are pending in the application.
 Of the above, claims _____ are withdrawn from consideration.
2. ☒ Claims 1-23 and 36 have been cancelled.
3. ☐ Claims _____ are allowed.
4. ☒ Claims 24-35 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ Claims _____ are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____, has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed _____, has been ☐ approved; ☐ disapproved (see explanation).
12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____; filed on _____.
13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

EXAMINER'S ACTION

PTOL-326 (Rev. 2/93)

MA000396

Serial Number: 08/452,646

Page 2

Art Unit: 3107

-Part III-

1. The fee calculation sheet and file wrapper indicates 12 claims (apparently claims 24-35) are present in the application. An apparent preamendment cancelling claims 1-23 and 36 (which were prosecuted in parent application SN 08/295495) has been misplaced. If the above is correct, Applicants cooperation in ratifying the cancellation of claims 1-23 and 36 would be appreciated.

2. Claims 24-35 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 24, it is not understood how the packages" (line 1) relate to the "medicine packages" (lines 4 and 5, etc.); further, no antecedent basis exists for "the location" (lines 14 and 15); lastly, an improper inference is created that the supply means supplies the rod when in point of disclosure, the rods are supplied from the supplying means by means of the picking means. Re claim 27, no antecedent basis exists for "tooling" (line 4). Re claim 35, no antecedent basis exists for "the back rod supports".

3. The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section

Serial Number: 08/452,646

Page 3

Art Unit: 3107

102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103.

5. Claims 24, 25 and 35 are rejected under 35 U.S.C. § 103 as being unpatentable over Morello et al in view of the European Patent (,304).

Morello et al disclose storage areas 40, automated picking means 20, 62, etc. on tracks 98 (99), supplying means 22 and computer means 26 to assign the package to X-Y coordinates (column 11, lines 11-17) and to control the picking means, but do not disclose support rods which is disclosed by the European Patent (, 304) (15, etc.) and in view of the same, it would have been obvious to have substituted holding means as taught by the European Patent (, 304) as this would have been the substitution

Serial Number: 08/452,646

Page 4

Art Unit: 3107

of equivalent holding means productive of no unexpected result. The handling of conventional medicine packages (as claimed) would have been obvious to one skilled in the art. Re claim 35, it would have been obvious to have conventionally formed the rods and gripper (as claimed) depending on the intended application.

6. Claims 26 to 29 are rejected under 35 U.S.C. § 103 as being unpatentable over Morello et al in view of the European Patent (, 304) as applied to claims 24, 25 and 35 above, and further in view of Buttarazzi.

Buttarazzi (42, 21, 88, etc.) teaches and renders obvious the alternate use of containers (filled by picking means) placed on a conveyor. The use of conventional plural containers (as claimed) would have been obvious. Re claims 28 and 29, the use of conventional identifying means (such as a bar code in claim 29) would have been obvious.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to F.E. Werner whose telephone number is (703) 308-1140. The examiner can normally be reached on Tuesday-Friday from 6:30 AM to 5:00 PM.

Serial Number: 08/452,646

Page 5

Art Unit: 3107

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Huppert, can be reached on (703) 308-1107. The fax phone number for this Group is (703) 305-7687.

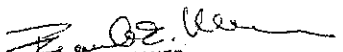
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-1113.

Summary:

Claims 24-35 are rejected.

Rejection-SSP 3 mos.

Werner/mm
August 08, 1995


FRANK E. WERNER
PRIMARY EXAMINER 8/9/95
GROUP 3100

Form PTO 948 (Rev. 10-94)

U.S. DEPARTMENT OF COMMERCE - Patent and Trademark Office

Application No.

452646

NOTICE OF DRAFTSPERSON'S PATENT DRAWING REVIEW

PTO Draftpersons review all originally filed drawings regardless of whether they are designated as formal or informal. Additionally, patent Examiners will review the drawings for compliance with the regulations. Direct telephone inquiries concerning this review to the Drawing Review Branch, 703-305-8404.

The drawings filed (insert date) 5/25/95 are

☒ not objected to by the Draftsperson under 37 CFR 1.84 or 1.152.

☐ objected to by the Draftsperson under 37 CFR 1.84 or 1.152 as indicated below. The Examiner will require submission of new, corrected drawings when necessary. Corrected drawings must be submitted according to the instructions on the back of this Notice.

- DRAWINGS.** 37 CFR 1.84(a): Acceptable categories of drawings:
 - Black ink. Color.
 - Not black solid lines. Fig(s) _____
 - Color drawings are not acceptable until petition is granted. Fig(s) _____
- PHOTOGRAPHS.** 37 CFR 1.84(b)
 - Photographs are not acceptable until petition is granted. Fig(s) _____
 - Photographs not properly mounted (must use crystal board or photographic double-weight paper). Fig(s) _____
 - Poor quality (half-tone). Fig(s) _____
- GRAPHIC FORMS.** 37 CFR 1.84(d)
 - Chemical or mathematical formula not labeled as separate figure. Fig(s) _____
 - Group of waveforms not presented as a single figure, using common vertical axis with time extending along horizontal axis. Fig(s) _____
 - Individual waveforms not identified with a separate letter designation adjacent to the vertical axis. Fig(s) _____
- TYPE OF PAPER.** 37 CFR 1.84(e)
 - Paper not flexible, strong, white, smooth, nonshiny, and durable. Sheet(s) _____
 - Erasures, alterations, overwritings, interlinations, cracks, creases, and folds copy machine marks not accepted. Fig(s) _____
 - Mylar, velum paper is not acceptable (too thin). Fig(s) _____
- SIZE OF PAPER.** 37 CFR 1.84(f): Acceptable sizes:

21.6 cm. X 35.6 cm. (8 1/2 X 14 inches)	21.6 cm. X 33.1 cm. (8 1/2 X 13 inches)	21.6 cm. X 27.9 cm. (8 1/2 X 11 inches)	21.0 cm. X 29.7 cm. (8 1/8 X 11 3/4 inches)
(DIN size A4)	(DIN size A5)	(DIN size A6)	(DIN size A7)
21.6 cm. (8 1/2")	35.6 cm. (14")	33.1 cm. (13")	27.9 cm. (11")
21.6 cm. (8 1/2")	33.1 cm. (13")	27.9 cm. (11")	21.0 cm. (8 1/8")

 - All drawing sheets not the same size. Sheet(s) _____
 - Drawing sheet not an acceptable size. Sheet(s) _____
- MARGINS.** 37 CFR 1.84(g): Acceptable margins:

21.6 cm. X 35.6 cm. (8 1/2 X 14 inches)	21.6 cm. X 33.1 cm. (8 1/2 X 13 inches)	21.6 cm. X 27.9 cm. (8 1/2 X 11 inches)	21.0 cm. X 29.7 cm. (8 1/8 X 11 3/4 inches)
(DIN size A4)	(DIN size A5)	(DIN size A6)	(DIN size A7)
25 mm. (1")	25 mm. (1")	25 mm. (1")	25 mm. (1")
25 mm. (1")	25 mm. (1")	25 mm. (1")	25 mm. (1")

 - Margins do not conform to chart above. Sheet(s) 1-3(e), 7, 11, 15-19
 - Top (T) _____ Left (L) _____ Right (R) _____ Bottom (B) _____
- VIEWS.** 37 CFR 1.84(h)
 - REMINDER: Specification may require revision to correspond to drawing changes.
 - All views not grouped together. Fig(s) _____
 - Views connected by projection lines or lead lines. Fig(s) _____
 - Partial views. 37 CFR 1.84(h) 2
 - View and enlarged view not labeled separately or properly. Fig(s) _____
 - Sectional views. 37 CFR 1.84(h) 3
 - Hatching not indicated for sectional portions of an object. Fig(s) _____
 - Cross section not drawn same as view with parts in cross section with regularly spaced parallel oblique strokes. Fig(s) _____
- ARRANGEMENT OF VIEWS.** 37 CFR 1.84(i)
 - Views do not appear on a horizontal, left-to-right fashion when page is either upright or turned so that the top becomes the right side, except for graphs. Fig(s) _____
- SCALE.** 37 CFR 1.84(j)
 - Scale not large enough to show mechanism with crowding when drawing is reduced in size to two-thirds in reproduction. Fig(s) _____
 - Indication such as "actual size" or scale 1/2" not permitted. Fig(s) _____
- CHARACTER OF LINES, NUMBERS, & LETTERS.** 37 CFR 1.84(k)
 - Lines, numbers, & letters not uniformly thick and well defined, clean, durable, and black (except for color drawings). Fig(s) 6
- SHADING.** 37 CFR 1.84(l)
 - Solid black shading areas not permitted. Fig(s) 11, 15
 - Shade lines, pale, rough and blurred. Fig(s) _____
- NUMBERS, LETTERS, & REFERENCE CHARACTERS.** 37 CFR 1.84(p)
 - Numbers and reference characters not plain and legible. 37 CFR 1.84(p)(1) Fig(s) _____
 - Numbers and reference characters not oriented in same direction as the view. 37 CFR 1.84(p)(1) Fig(s) _____
 - English alphabet not used. 37 CFR 1.84(p)(2) Fig(s) _____
 - Numbers, letters, and reference characters do not measure at least .32 cm. (.125 inch) in height. 37 CFR(p)(3) Fig(s) 5, 6
- LEAD LINES.** 37 CFR 1.84(q)
 - Lead lines cross each other. Fig(s) _____
 - Lead lines missing. Fig(s) _____
- NUMBERING OF SHEETS OF DRAWINGS.** 37 CFR 1.84(i)
 - Sheets not numbered consecutively, and in Arabic numerals, beginning with number 1. Sheet(s) _____
- NUMBER OF VIEWS.** 37 CFR 1.84(u)
 - Views not numbered consecutively, and in Arabic numerals, beginning with number 1. Fig(s) _____
 - View numbers not preceded by the abbreviation Fig. Fig(s) _____
- CORRECTIONS.** 37 CFR 1.84(w)
 - Corrections not made from prior PTO-948. Fig(s) _____
- DESIGN DRAWING.** 37 CFR 1.152
 - Surface shading shown not appropriate. Fig(s) _____
 - Solid black shading not used for color contrast. Fig(s) _____

COMMENTS:

ATTACHMENT TO PAPER NO. 3

PTO Copy

REVIEWER JA

12-1-10

TO SEPARATE, HOLD TOP AND BOTTOM EDGES, SNAP-APART AND DISCARD CARBON

FORM PTO-892 (REV. 2-92)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		SERIAL NO. 08/452646		GROUP/ART UNIT 3107		ATTACHMENT TO PAPER NUMBER 3				
NOTICE OF REFERENCES CITED				APPLICANT(S) Sean C. McDonald et al								
U.S. PATENT DOCUMENTS												
*		DOCUMENT NO.				DATE	NAME	CLASS	SUB-CLASS	FILING DATE IF APPROPRIATE		
	A											
	B											
	C											
	D											
	E											
	F											
	G											
	H											
	I											
	J											
	K											
FOREIGN PATENT DOCUMENTS												
*		DOCUMENT NO.				DATE	COUNTRY	NAME	CLASS	SUB-CLASS	PERTINENT SHTS. DWG.	PP. SPEC.
	L				304	1-1979	European	—	414	273		
	M											
	N											
	O											
	P											
	Q											
OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)												
	R											
	S											
	T											
	U											
EXAMINER F.E. Werner						DATE 8/25						
* A copy of this reference is not being furnished with this office action. (See Manual of Patent Examining Procedure, section 707.05 (a).)												



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of
MCDONALD, S.
Application No. 08/452,646
Filing Date 05/25/95

Art Group _____
August 1, 1995

Werner #4
Chy fa
V.W
9-2-95

Short Title: AN AUTOMATED SYSTEM FOR SELECTING PACKAGES FROM A STORAGE

CHANGE OF ADDRESS

Hon. Commissioner of Patents and Trademarks
Washington, D. C.

Please note that effective September 1, 1995, the
attorney's address will be changed from 600 Grant Street,
Pittsburgh, Pa. to:

*
* NEW ADDRESS *
*

Buchanan Ingersoll P.C.
One Oxford Centre
20th Floor
301 Grant Street
Pittsburgh, Pa.
15219-1410

Please address all correspondence to us at the new address.
The telephone numbers for our attorney(s) remains
unchanged, and the general telephone number is 412 562-8800
if you need any further information.

Respectfully submitted,

Buchanan Ingersoll
BUCHANAN INGERSOLL, P.C.

atty. docket 950441

move-usapp



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

General Art Unit 3107

PATENT

Examiner F. Werner

In re application of

SEAN C. McDONALD et al.

Serial No. 08/452,616

Filed May 25, 1995

5/12
12-19-95

AN AUTOMATED SYSTEM FOR
SELECTING AND DELIVERING
PACKAGES FROM A STORAGE
AREA

3101

I hereby certify that this correspondence is being
deposited with the United States Patent and Trademark
Office and is being made available to the public in the
Office of Patents and Trademarks, Washington, D.C. 20231,
on

AMENDMENT

November 21, 1995

Pittsburgh, Pennsylvania 15219

November 21, 1995

Hon. Commissioner of Patents and Trademarks

Washington, D.C. 20231

Sir:

Please amend the claims as follows:

Subst.
B-1
A1

24. (Amended) A system for selecting and delivering medicine packages from a
holding means to fill orders comprising:

a) a holding means comprised of a frame having a plurality of support rods each
support rod sized for holding a plurality of medicine packages, each rod associated with a given
medicine and holding medicine packages with only the same medicine each support rod having a
distinct X, Y coordinate location;

A

b) [means for supplying medicine packages to the support rods;

c)] means for picking medicine packages from the support rods in accordance with instructions received from a computer, said picking means being able to access the holding means [and the supply means]; ~~the picking means capable of holding a plurality of medicine packages which have been picked from the holding means; and~~

~~e [d)] a computer having a database containing an X, Y coordinate location (the locations of) for all packages in the holding means, the computer able to receive orders for packages and able to direct the means for picking packages.~~

25. (Amended) A system as described in claim 24 ~~also comprising a supply~~ [wherein the] structure [including] having a plurality of [rod supports from which the rods extend,] ~~supply support rods which extend from said structure [with back rod supports] to form~~ an X, Y coordinate system, with each ~~supply support~~ rod and medicine package [therein] ~~thereon~~ having a unique X and Y coordinate, ~~said picking means disposed [adjacent] to have access to~~ said structure such that a given medicine package on an associated ~~supply support~~ rod can be picked by the picking means to fill a patient's prescription; or a given medicine package in the [supplying means] ~~supply structure~~ can be picked by the picking means to restock [the] ~~an~~ associated rod ~~in the holding means.~~

In claim 26, line 1, change "claim 25" to -- claim 24 --.

327. (Amended) A system as described in claim [26] ~~24~~ wherein the picking means includes at least one gripper that picks the medicine packages; and a tooling support structure having at least one column [to support] ~~supporting~~ the column such that the [tooling]

02 picking means moves along the column as the column moves along the row to pick a given medicine package hanging from a corresponding support rod, or restock a given medicine package on a corresponding support rod; and means for moving the column with respect to the row, said moving means controlled by the computer.

4 ~~28~~ ³ (Amended) A system as described in claim ~~27~~ wherein the [tooling] picking means is comprised of:

a housing;

means for storing a plurality of medicine packages attached to the housing;

means for obtaining a medicine package, said obtaining means slidably attached to the housing such that it can move in a Z direction, which is perpendicular to the X and Y directions, to pick a medicine package from a support [structure] rod when the housing is adjacent to and aligned with a support rod, and can move in the Z direction to place a picked package on the storing means; and

[wherein the] identifying means [is part of] attached to the at least one gripper such that it can identify a package to be picked by the obtaining means, each of said packages having an identity disposed on them which can be read by the identifying means.

✓ ~~30~~ (Amended) A system [as described in claim 29 wherein] for selecting and delivering packages from a holding means to fill orders comprising:

0-7 a) holding means comprised of a frame having a plurality of support rods for holding packages each support rod having a distinct X, Y coordinate location and holding a plurality of packages, all of those packages on each support rod having similar contents;

b) picking means for picking packages from the support rods in accordance with instructions received from a computer, the picking means being able to access the holding means and having

AB can't
a housing;

means for storing packages attached to the housing;

[the obtaining means includes] means for producing a suction;

a suction rod in fluid connection with the suction producing means, said suction rod slidingly attached with respect to the Y and Z directions to the housing and maintaining a suction therethrough when the suction producing means is activated[; a suction is connected to the suction rod through] by which a medicine package is picked with suction; and

means for sensing when a package is properly positioned [on the suction head]

such that the package rod is then moved to the storing means and deposits the package thereon.

AB
35. (Amended) A system as claimed in claim 24 wherein the support rods extend from [the] back rod supports within the frame in sets of two, with a first rod and a second rod on each set pointing essentially in a Z direction, which is perpendicular to the X and Y directions, but approximately 180° apart from each other[, and wherein the picking means includes a first gripper and a second gripper that picks the medicine packages; and a first and second tooling support structure, each tooling support structure having at least one column and at least one row to support the column, such that the first and the second tooling moves along the respective column and the respective column moves along the respective row of the first and second tooling

03 support structure, respectively, to pick a given medicine package from a corresponding support rod, or restock a support rod with an associated medicine package].

REMARKS

✓ This is in response to the Office Action dated August 21, 1995. Applicants confirm that claims 1 thru 23 and 36 were cancelled when the application was filed.

The Section 112 Rejections

The Examiner rejected all pending claims under Section 112 citing specific problems with claims 24, 27 and 25. Claim 24, 27 and 35 have been amended to overcome the stated problems. Reconsideration of the claims as amended and withdrawal of the Section 112 rejections are, therefore, respectfully requested.

The Section 103 Rejections

The pending claims have been rejected under Section 103 as obvious from United States Patent No. 4,896,024 to Morello et al. in combination with European Patent Application 304 and Buttarazzi United States Patent No. 4,546,901. Applicants have amended claim 24 to require that each support rod be able to hold a plurality of packages and that the picking means be capable of holding a plurality of packages after those packages have been retrieved from the holding means.

Morello et al. discloses an apparatus for dispensing and accepting the return of reusable articles such as videotapes. The apparatus has a housing containing a plurality of stationary locations each location being capable of holding a single reusable article therein and having its own location code. A transfer assembly is utilized to remove individual articles from selected locations and return articles to selected locations. As shown in Figures 3, 7, 8 and 9 and described at column 9, line 50 thru column 10, line 37, the Morello system includes a picker assembly having a platen suitable for receiving one selected article. The platen contains two, generally parallel, spaced apart plates mounted to a base plate. The plates define the location into which the selected article is positioned. The teaching of Morello et al. is that the transfer assembly be sent to a specific location to select one directed article stored in that location. The article is removed from the location into the picker assembly. There the identification code of the article is read. The picker assembly then delivers the article to a pick-up location. The picker assembly can also receive individual articles which have been placed at the gate mechanism 22. As disclosed, the picker assembly and the gate mechanism can handle only a single article at any given point in time. Similarly each location can accommodate a single article at any given point in time. Storage of many articles at a single location as well as selecting multiple packages before delivery is not taught or suggested by Morello. The Examiner has recognized that Morello also does not teach or suggest the use of support rods to hold the videotape packages.

The Examiner argues that those skilled in the art would use the rods of the cited European patent in the Morello system. However, if such a combination were made one would have a system that stored single packages at distinct locations on rods. Yet, the amended claims

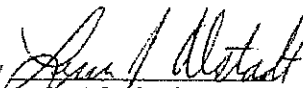
require a plurality of packages be held on each rod and also that the picking means be capable of holding a plurality of packages. This combination is not taught or suggested by the cited combination. Furthermore, these references do not teach or suggest storing similar packages of medicine on a single rod in an automated system. Since none of the other references teach or suggest the system of amended claim 24, the claimed system is patentable over the prior art. Claims 25 thru 29 depend directly or indirectly from claim 24 and, therefore, are also patentable.

Claim 30 has been rewritten in independent form. The Examiner did not cite any art against this claim. Hence, it is patentable over the prior art. Claims 31 thru 34 depend from patentable claim 30 and are, therefore, patentable.

Reconsideration and allowance of the claims as amended are respectfully requested.

Respectfully submitted,

BUCHANAN INGERSOLL, P.C.

By 
Lynn J. Alstadt
Registration No. 29,362

Attorney for Applicants

(412) 562-1632



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

RECEIVED
DEC 14 1995

PATENT GROUP 310

Group Art Unit 3107

Examiner F. Werner

In re application of

SEAN C. McDONALD et al.

Serial No. 08/452,646

Filed May 25, 1995

: AN AUTOMATED SYSTEM FOR
: SELECTING AND DELIVERING
: PACKAGES FROM A STORAGE
: AREA**LETTER**

Pittsburgh, Pennsylvania 15219

November 22, 1995

Hon. Commissioner of Patents and Trademarks

Washington, D.C. 20231

Sir:

An Amendment was mailed to the Patent and Trademark Office on November 21, 1995, for the above-identified patent application. Unfortunately, the serial number listed in the identification of the application was incorrect. We are, therefore, enclosing a revised page bearing the correct Serial No. 08/452,646.


I hereby certify that this correspondence is being deposited with the United States Patent Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on 11-22-95

Buchanan Ingersoll
Angie Beyer

It is respectfully requested that this revised page be substituted for the page bearing the incorrect Serial No. 08/452,656.

Respectfully submitted,

BUCHANAN INGERSOLL, P.C.

By 
Lynn K. Alstadt
Registration No. 29,362

Attorney for Applicants

(412) 562-1632


**UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office**

 Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
---------------	-------------	----------------------	---------------------

08/452,646 05/25/95 MCDONALD

S 950441

EXAMINER

WERNER, F

ART UNIT

PAPER NUMBER

F1M1/0318

 BUCHANAN INGERSOLL P.C.
ONE OXFORD CENTRE
20TH FLOOR
301 GRANT STREET
PITTSBURGH, PA. 15219-1410

3107

DATE MAILED:

03/18/96

 This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☐ This application has been examined ☒ Responsive to communication filed on Nov. 24, 1995 ☒ This action is made final.

 A shortened statutory period for response to this action is set to expire 3 month(s), days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- | | |
|---|---|
| 1. <input type="checkbox"/> Notice of References Cited by Examiner, PTO-892. | 2. <input type="checkbox"/> Notice of Draftsman's Patent Drawing Review, PTO-948. |
| 3. <input type="checkbox"/> Notice of Art Cited by Applicant, PTO-1448. | 4. <input type="checkbox"/> Notice of Informal Patent Application, PTO-152. |
| 5. <input type="checkbox"/> Information on How to Effect Drawing Changes, PTO-1474. | 6. <input type="checkbox"/> _____ |

Part II SUMMARY OF ACTION

1. ☒ Claims 24-35 are pending in the application.
Of the above, claims _____ are withdrawn from consideration.
2. ☒ Claims 1-23 and 36 have been cancelled.
3. ☒ Claims 30-34 are allowed.
4. ☒ Claims 24, 35 are rejected.
5. ☒ Claim 25 is objected to.
6. ☐ Claims _____ are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____, has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed _____, has been ☐ approved; ☐ disapproved (see explanation).
12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____; filed on _____.
13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

EXAMINER'S ACTION

PTOL-326 (Rev. 2/83)

MA000413

Serial Number: 08/452,646
Art Unit: 3107

Page 2

-Part III-

1. Claims 24-35 are rejected under 35 U.S.C. § 103 as being unpatentable over .

Re at least base claim 24, it is not clear whether the picking means holds the packages at the same time or at a different time.

2. The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103.

4. Claims 24, and 35 are rejected under 35 U.S.C. § 103 as being unpatentable over Morello et al in view of the European Patent, (,304).

Morello et al disclose storage areas 40, automated picking

Serial Number: 08/452,646
Art Unit: 3107

Page 3

means 20, 63, etc. on tracks 98 (99), supplying means 22 and computer means 26 to assign the package to X-Y coordinates (column 11, lines 11-17) and to control the picking means, but do not disclose support rods which is disclosed by the European Patent (,304) (15, etc.) and in view of the same, it would have been obvious to have substituted holding means as taught by the European Patent (,304) as this would have been the substitution of equivalent holding means productive of no unexpected result. When storing articles on a rod, it would have been obvious to have collected a plurality of articles by the picking means as taught by the European Patent (,304) (15, 20, 21, etc.). The handling of conventional medicine packages (as claimed) would have been obvious to one skilled in the art. Re claim 35, it would have been obvious to have conventionally formed the rods and gripper (as claimed) depending on the intended application.

40- Claims 26 to 29 are rejected under 35 U.S.C. § 103 as being unpatentable over Morello et al in view of the European Patent (,304) as applied to claims 24, and 35 above, and further in view of Buttarazzi.

Buttarazzi (42, 21, 88, etc.) teaches and renders obvious the alternate use of containers (filled by picking means) placed on a conveyor. The use of conventional plural containers (as claimed) would have been obvious. Re claims 28 and 29, the use of conventional identifying means (such as a bar code in claim 29) would have been obvious.

Serial Number: 08/452,646
Art Unit: 3107

Page 4

5. Claim 25 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Applicant's arguments filed Nov. 24, 1995 have been fully considered but they are not deemed to be persuasive.

Re applicants' "Remarks" on pages 6 and 7, please note the above rejections.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

Serial Number: 08/452,646
Art Unit: 3107

Page 5

8. Any inquiry concerning this communication should be directed to F. E. Werner at telephone number (703) 308-1140.

Summary:

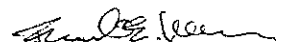
Claims 24, 26-29 and 35 are rejected.

Claims 30-34 are allowed.

Claims 25 is objected to

Final Rejection-SSP 3mos.

Werner/oc
March 04, 1996


FRANK E. WERNER
PRIMARY EXAMINER 3/96
GROUP 3100



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit 3107

PATENT

Examiner F. Werner

In re application of

 : AN AUTOMATED SYSTEM FOR
 : SELECTING AND DELIVERING
 : PACKAGES FROM A STORAGE
 : AREA

SEAN C. McDONALD et al.

Serial No. 08/452,646

Filed May 25, 1995

I hereby certify that this correspondence is being
 directed with the United States Postal Service as first
 class mail in an envelope addressed to: Commissioner
 of Patents and Trademarks, Washington, D.C. 20231,
 on

AMENDMENT

May 20 1996
 Sean McDonald
 [Signature]

Pittsburgh, Pennsylvania 15219

May 20, 1996

Hon. Commissioner of Patents and Trademarks

Washington, D.C. 20231

Sir:

Please amend the claims as follows:

1/24. (Twice Amended) A system for selecting and delivering medicine packages
 from a holding means to fill orders comprising:

a) a holding means comprised of a frame having a plurality of support rods each
 support rod sized for holding a plurality of medicine packages, each rod associated with a given
 medicine and holding medicine packages with only the same medicine each support rod having a
 distinct X, Y coordinate location;

Enter
 4-9/96
 B. C. 5/96

470

b) means for picking medicine packages from the support rods in accordance with instructions received from a computer, said picking means being able to access the holding means; the picking means capable of holding a plurality of medicine packages which have been picked from the holding means; [and]

c) a computer having a database containing an X, Y coordinate location for all packages in the holding means, the computer able to receive orders for packages and able to direct the means for picking packages; and

B. cont'd
RW
d) a supply structure having a plurality of supply support rods which extend from said structure to form an X, Y coordinate system, with each supply support rod and medicine package thereon having a unique X and Y coordinate, said picking means disposed to have access to said structure such that a given medicine package on an associated supply support rod can be picked by the picking means to fill a patient's prescription, or a given medicine package in the supply structure can be picked by the picking means to restock an associated rod in the holding means.

✓
Cancel claim 25.

REMARKS

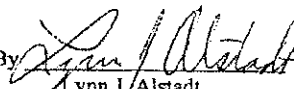
This is in response to the Office Action dated March 18, 1996. By this Amendment applicants have amended claim 24 to include the subject matter of claim 25 and cancelled claim 25.

In the Office Action the Examiner allowed claims 30 thru 34 and said claim 25 would be allowable if rewritten in independent form. The present amendment does this. Therefore, claim 24 as amended is allowable. Claims 26, 27, 28, 29 and 35 depend directly or indirectly from claim 24. Consequently, these claims are allowable.

Reconsideration and allowance of the claims as amended are respectfully requested.

Respectfully submitted,

BUCHANAN INGERSOLL, P.C.

By 
Lynn J. Alstadt
Registration No. 29,362

Attorney for Applicants

(412) 562-4632



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
3101	01/11/06	McDONALD	S 950441

VERNER, F EXAMINER

3101/0606

McDONALD, P.C.

1000 10th St NW

Washington, D.C.

20000

10019-1410

ART UNIT PAPER NUMBER

3107

9

06/06/96

DATE MAILED:

NOTICE OF ALLOWABILITY

PART I

1. ☒ This communication is responsive to the amendment of May 22, 1996.
 2. ☒ All the claims being allowable. PROSECUTION ON THE MERITS IS ~~FOR REMAINS~~ CLOSED in this application. If not included herewith (or previously mailed), a Notice Of Allowance And Issue Fee Due or other appropriate communication will be sent in due course.
 3. ☒ The allowed claims are 24 and 26-35.
 4. ☐ The drawings filed on _____ are acceptable.
 5. ☐ Acknowledgment is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received. ☐ not been received. ☐ been filed in parent application Serial No. _____, filed on _____.
 6. ☐ Note the attached Examiner's Amendment.
 7. ☐ Note the attached Examiner Interview Summary Record, PTOL-413.
 8. ☐ Note the attached Examiner's Statement of Reasons for Allowance.
 9. ☐ Note the attached NOTICE OF REFERENCES CITED, PTO-892.
 10. ☐ Note the attached INFORMATION DISCLOSURE CITATION, PTO-1449.
- II. ☒ No claims have been allowed because the prior art does not disclose or teach the combination of the claimed holding means, picking means, computer and supply structure (claim 24) and holding means, picking means, computer and supply structure (claim 25) and holding means, picking means, computer and supply structure (claim 26).
- PART II. Pickling means, computer and supply structure (claim 24) and holding means, picking means, computer and supply structure (claim 25) and holding means, picking means, computer and supply structure (claim 26).
- A SHORTENED STATUTORY PERIOD FOR RESPONSE to comply with the requirements noted below is set to EXPIRE THREE MONTHS FROM THE "DATE MAILED" indicated on this form. Failure to timely comply will result in the ABANDONMENT of this application. Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

1. ☐ Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION, PTO-152, which discloses that the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.
2. ☒ APPLICANT MUST MAKE THE DRAWING CHANGES INDICATED BELOW IN THE MANNER SET FORTH ON THE REVERSE SIDE OF THIS PAPER.
 - a. ☒ Drawing informalities are indicated on the NOTICE RE PATENT DRAWINGS, PTO-948, attached ~~handed~~ to Paper No. 3. CORRECTION IS REQUIRED.
 - b. ☐ The proposed drawing correction filed on _____ has been approved by the examiner. CORRECTION IS REQUIRED.
 - c. ☐ Approved drawing corrections are described by the examiner in the attached EXAMINER'S AMENDMENT. CORRECTION IS REQUIRED.
 - d. ☒ Formal drawings are now REQUIRED.

Any response to this letter should include in the upper right hand corner, the following information from the NOTICE OF ALLOWANCE AND ISSUE FEE DUE: ISSUE BATCH NUMBER, DATE OF THE NOTICE OF ALLOWANCE, AND SERIAL NUMBER.

Attachments:

- Examiner's Amendment
- Examiner Interview Summary Record, PTOL-413
- Reasons for Allowance
- Notice of References Cited, PTO-892
- Information Disclosure Citation, PTO-1449
- Notice of Informal Application, PTO-152
- Notice re Patent Drawings, PTO-948
- Listing of Bonded Draftsman
- Other

FRANK E. WERNER
PRIMARY EXAMINER 6/96
GROUP 3100


**UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office**

Address: Box ISSUE FEE
COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SUTHERLIN INGENSONLL P.C.
ONE CYTHER CENTER
20TH FLOOR
301 GRANT STREET
PITTSBURGH, PA 15019-1410

SENT/6646

**NOTICE OF ALLOWANCE
AND ISSUE FEE DUE**

- ☐ Note attached communication from the Examiner
☐ This notice is issued in view of applicant's communication filed _____

SERIES CODE/SERIAL NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
067-002,646	01/25/95	311	HERNER, T	01/07/95
First Named Applicant				

TITLE OF INVENTION
AUTOMATED SYSTEM FOR SELECTING AND DELIVERING PACKAGES FROM A STORAGE AREA

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
060441	01-007,000	072	UTILITY	YES	\$625.00	04/06/96

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED.

THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.

HOW TO RESPOND TO THIS NOTICE:

I. Review the SMALL ENTITY Status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

- If the status is changed, pay twice the amount of the FEE DUE shown above and notify the patent and Trademark Office of the change in status, or
- If the Status is the same, pay the FEE DUE shown above.

If the SMALL ENTITY is shown as NO:

- Pay FEE DUE shown above, or
- File verified statement of Small Entity Status before, or with, pay of 1/2 the FEE DUE shown above.

II. Part B of this notice should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by charge to deposit account, Part B should be completed and returned. If you are charging the ISSUE FEE to your deposit account, Part C of this notice should also be completed and returned.

III. All communications regarding this application must give series code (or filing date), serial number and batch number. Please direct all communication prior to issuance to Box ISSUE FEE unless advised to contrary.

IMPORTANT REMINDER: Patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B—ISSUE FEE TRANSMITTAL

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE. Blocks 2 through 6 should be completed where appropriate. All further correspondence including the Issue Fee Receipt, the Patent, advance orders and notification of maintenance fees will be mailed to addressee entered in Block 1 unless you direct otherwise, by: (a) specifying a new correspondence address in Block 3 below; or (b) providing the PTO with a separate "FEE ADDRESS" for maintenance fee notifications with the payment of Issue Fee or thereafter. See reverse for Certificate of Mailing.

1. CORRESPONDENCE ADDRESS		2. INVENTOR(S) ADDRESS CHANGE (Complete only if there is a change)	
<p><i>RIC</i></p> <p>01M1/0606</p> <p>01M1/0610</p>		<p>INVENTOR'S NAME RECEIVED</p> <p>Street Address Publishing Division</p> <p>City, State and ZIP Code SEP 9 1996</p> <p>CO-INVENTOR'S NAME</p> <p>Street Address GP</p> <p>City, State and ZIP Code</p> <p><input type="checkbox"/> Check if additional changes are on reverse side</p>	

SERIES CODE/SERIAL NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
03-452-646			WERNER, F	08/06/96
First Named Applicant				

TITLE OF INVENTION
 AUTOMATICALLY COLLECTING AND DELIVERING PACKAGES FROM A STORAGE AREA

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
3	01M1/0606	072	UTILITY	YES	\$625.00	09/06/96

3. Correspondence address change (Complete only if there is a change)	4. For printing on the patent front page, list the names of not more than 3 registered patent attorneys or agents OR, alternatively, the name of a firm having as a member a registered attorney or agent. If no name is listed, no name will be printed.
	<p>1 Buchanan Ingersoll, P.</p> <p>2 Lynn J. Alstadt</p> <p>3</p>

DO NOT USE THIS SPACE

5. ASSIGNMENT DATA TO BE PRINTED ON THE PATENT (print or type)

(1) NAME OF ASSIGNEE
 Automated Healthcare, Inc.

(2) ADDRESS (CITY & STATE OR COUNTRY)
 Pittsburgh, PA

- A. ☐ This application is NOT assigned.
☒ Assignment previously submitted to the Patent and Trademark Office.
☐ Assignment is being submitted under separate cover. Assignments should be directed to Box ASSIGNMENTS.

PLEASE NOTE: Unless an assignee is identified in Block 5, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the PTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

6a. The following fees are enclosed:

☒ Issue Fee ☐ Advance Order - # of Copies

6b. The following fees should be charged to:
 DEPOSIT ACCOUNT NUMBER 02-4553
 (ENCLOSE PART C)

☐ Issue Fee ☐ Advance Order - # of Copies
☒ Any Deficiencies in Enclosed Fees

The COMMISSIONER OF PATENTS AND TRADEMARKS is requested to apply the Issue Fee to the application identified above.

(Authorized Signature)

Lynn J. Alstadt 9/4/96
 NOTE: The Issue Fee will not be accepted from anyone other than the applicant, a registered attorney or agent, or the assignee or other party in interest as shown in the records of the Patent and Trademark Office.

1. TRANSMIT THIS FORM WITH FEE-CERTIFICATE OF MAILING ON REVERSE

PTOL-65B (REV.12-93)(0651-0033)

MA000423

Certificate of Mailing

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to:

Box ISSUE FEE
Commissioner of Patents and Trademarks
Washington, D.C. 20231

on September 5, 1996

(Date)

Vicki Cremonese

(Name of person making deposit)

(Signature)

(Date)

Note: If this certificate of mailing is used, it can only be used to transmit the Issue Fee. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing.

Burden Hour Statement: This form is estimated to take .2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Office of Information Systems, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, (Project 0651-0033), Washington, D.C. 20503. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner of Patents and Trademarks, Box Issue Fee, Washington, DC 20231.

①
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit 3107 : PATENT
Examiner F. Werner :
In re application of : AN AUTOMATED SYSTEM
Sean C. McDonald : FOR SELECTING AND
Serial No. 08/452,646 : DELIVERING PACKAGES
Filed May 25, 1995 : FROM A STORAGE AREA
Allowed June 6, 1996 :

LETTER

Pittsburgh, Pennsylvania 15219

September 5, 1996

Hon. Commissioner of Patents and Trademarks

Washington, D.C. 20231

Sir:

Please substitute the enclosed ten (10) sheets of drawings for those originally filed with the application. Entry of these drawings overcomes the objections to Figures 1 thru 3, 5, 6, 7, 10, 11, 15 and 19. The remaining drawings were approved.

A copy of the Draftsman's Rejection Sheet is enclosed. Entry of these drawings overcomes all of the objections there listed.

Respectfully submitted,

BUCHANAN INGERSOLL, P.C.

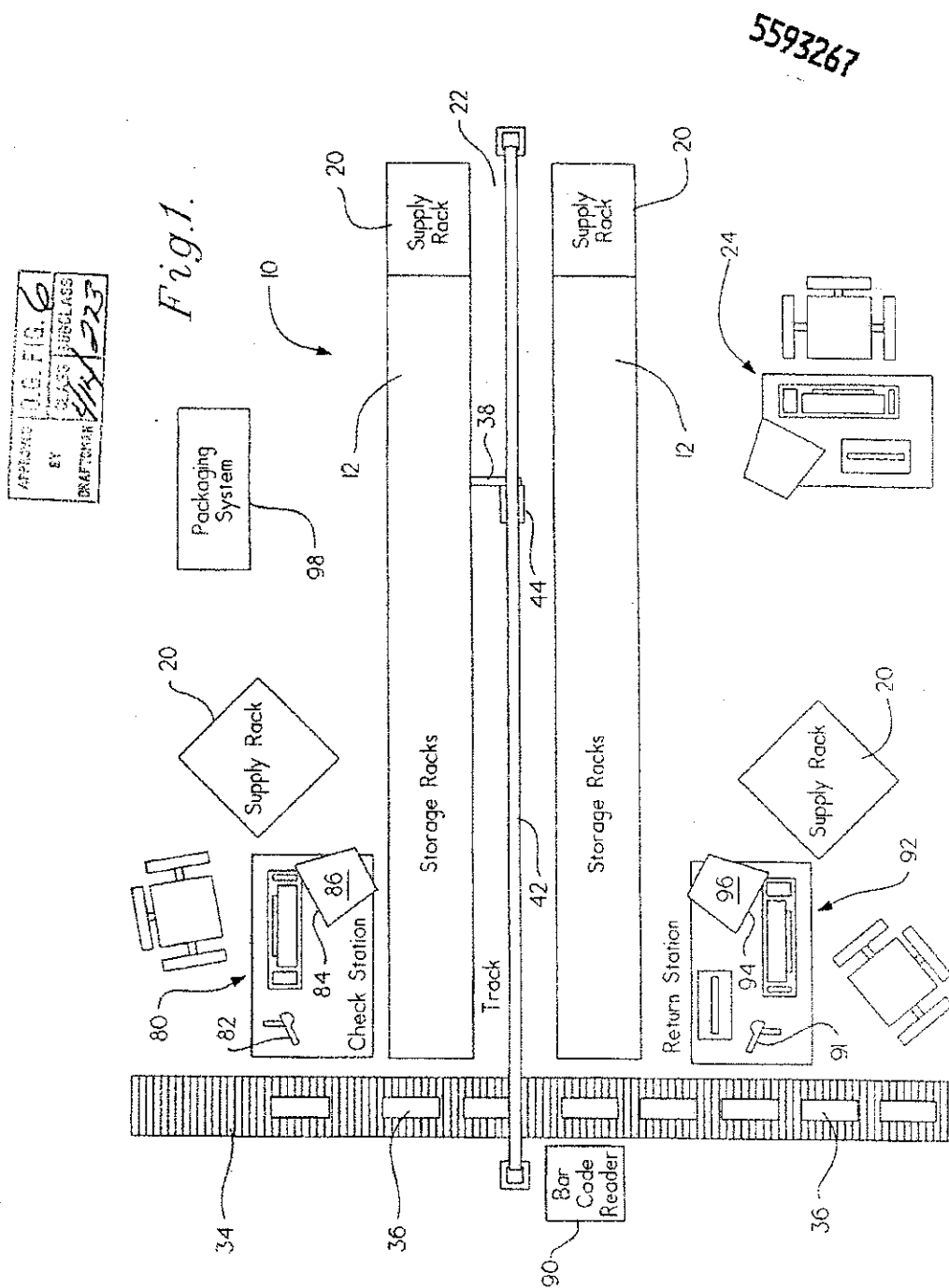
By

Eryn J. Alstadt
Eryn J. Alstadt

Registration No. 29,362

(412) 562-1632

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95 SEP -6 AM 11:23
DRAWING PROCESSING BRANCH
PUBLISHING DIVISION



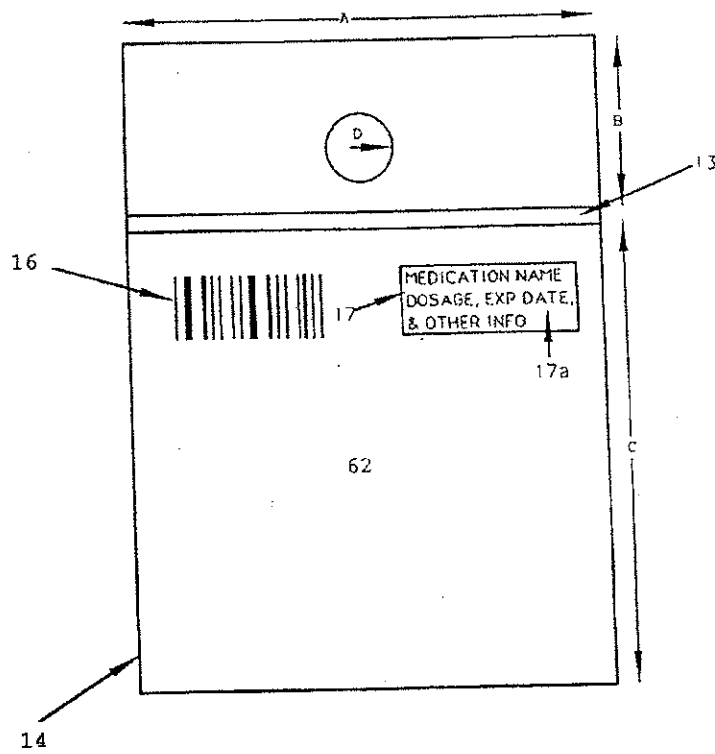


FIGURE 2

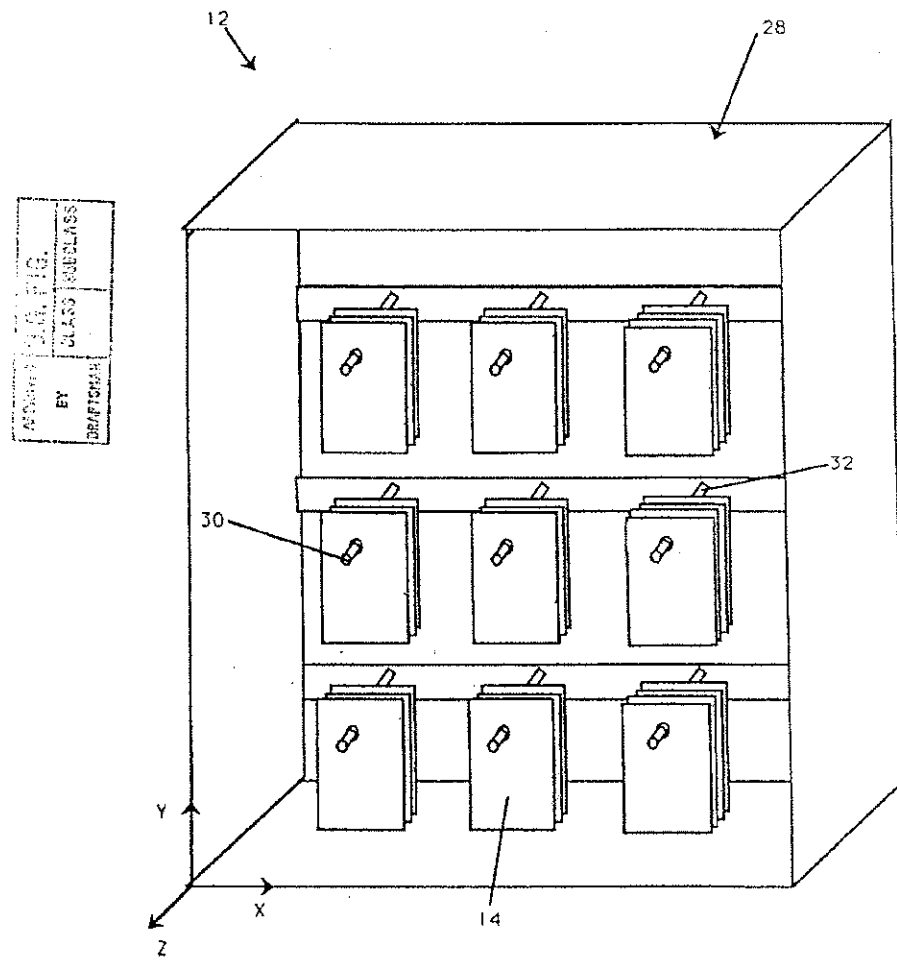
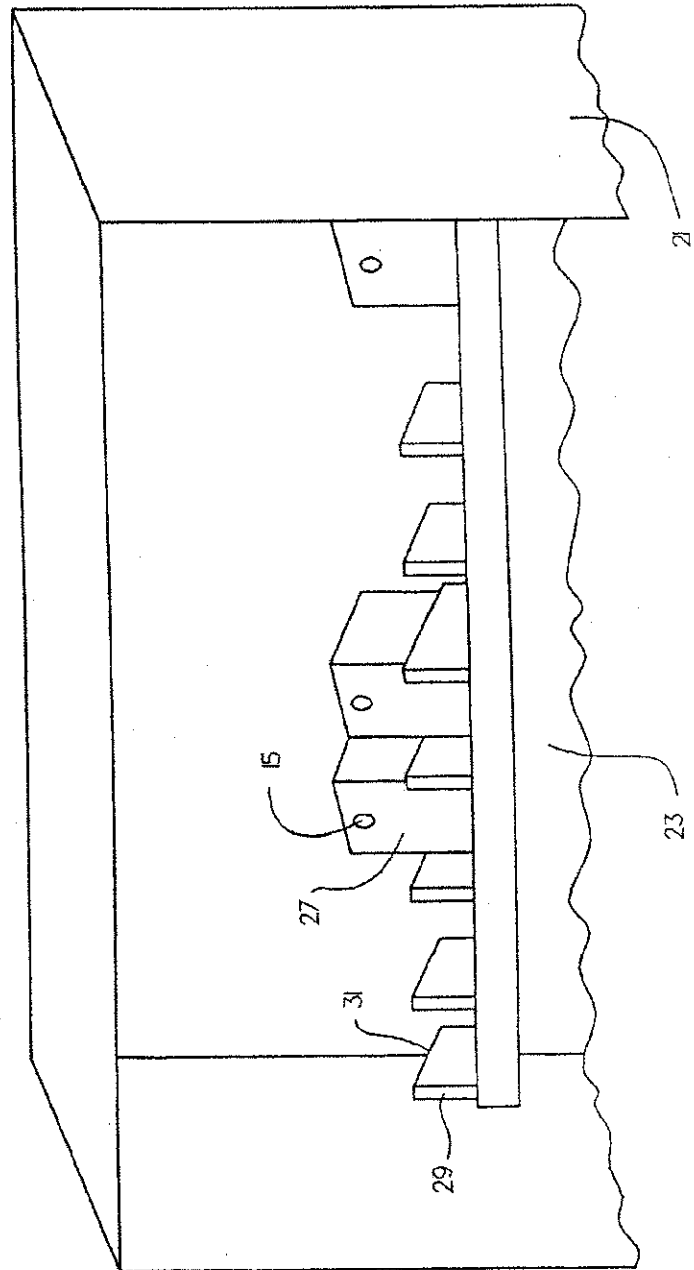


FIGURE 3

ATTORNEY	06. FIG.	
BY	CLASS	SUBCLASS
CRAFTSMAN		

Figure 5



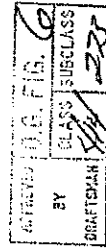
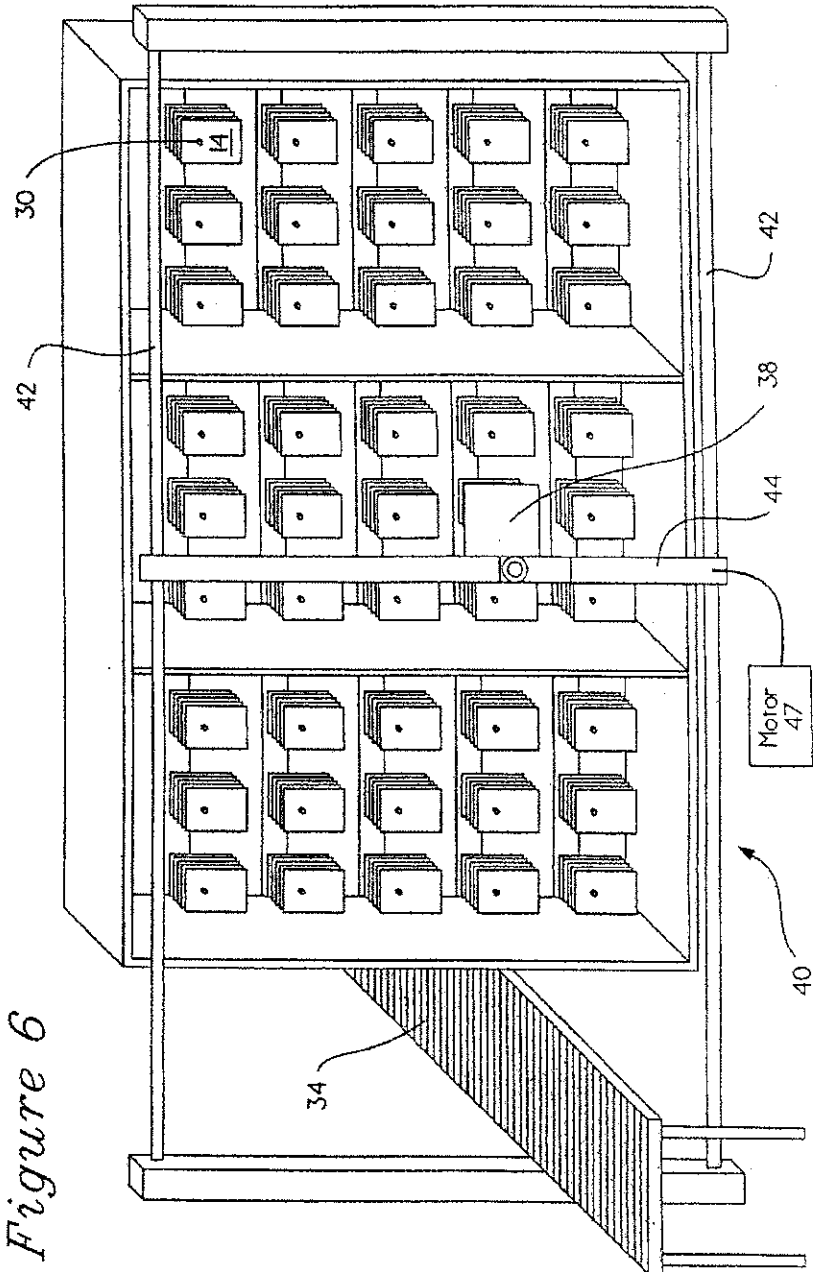


Figure 6



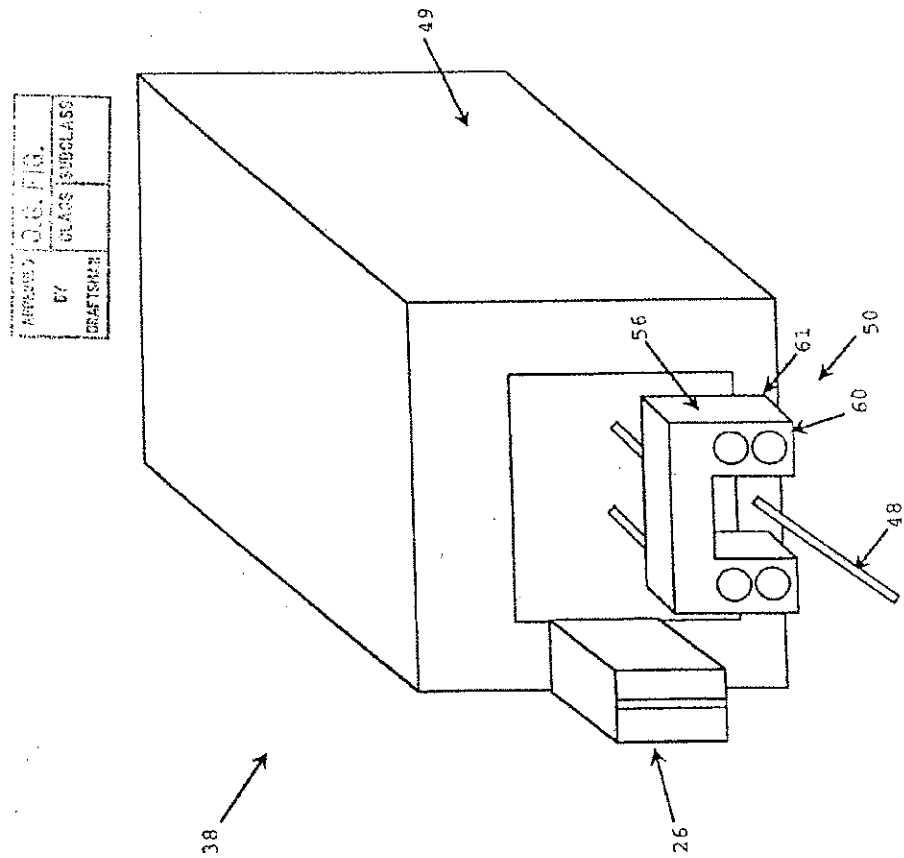


FIGURE 7

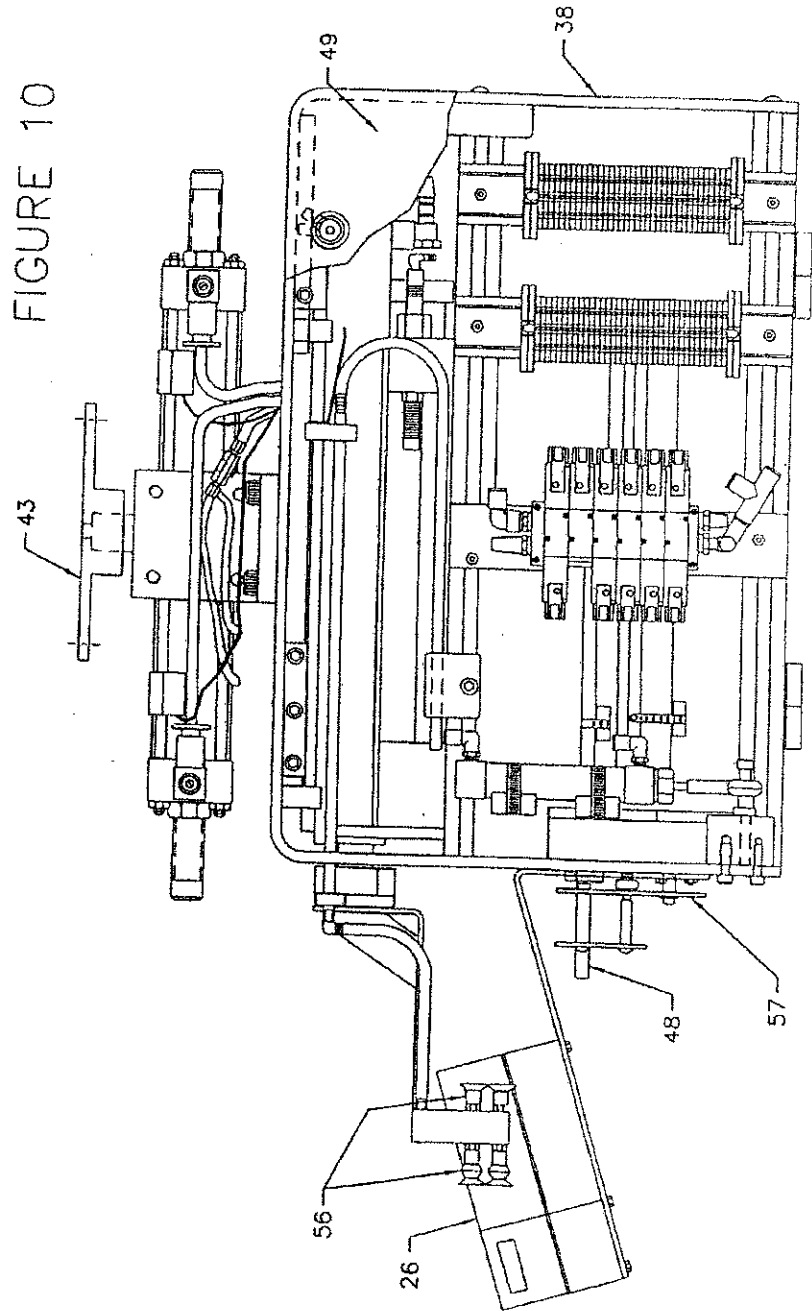
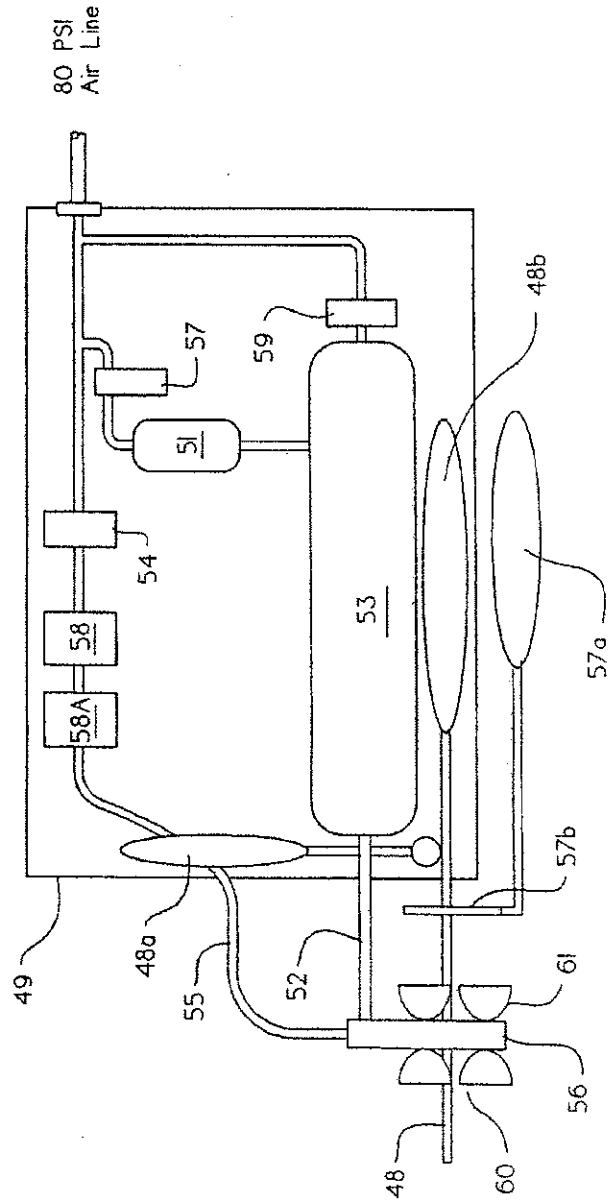
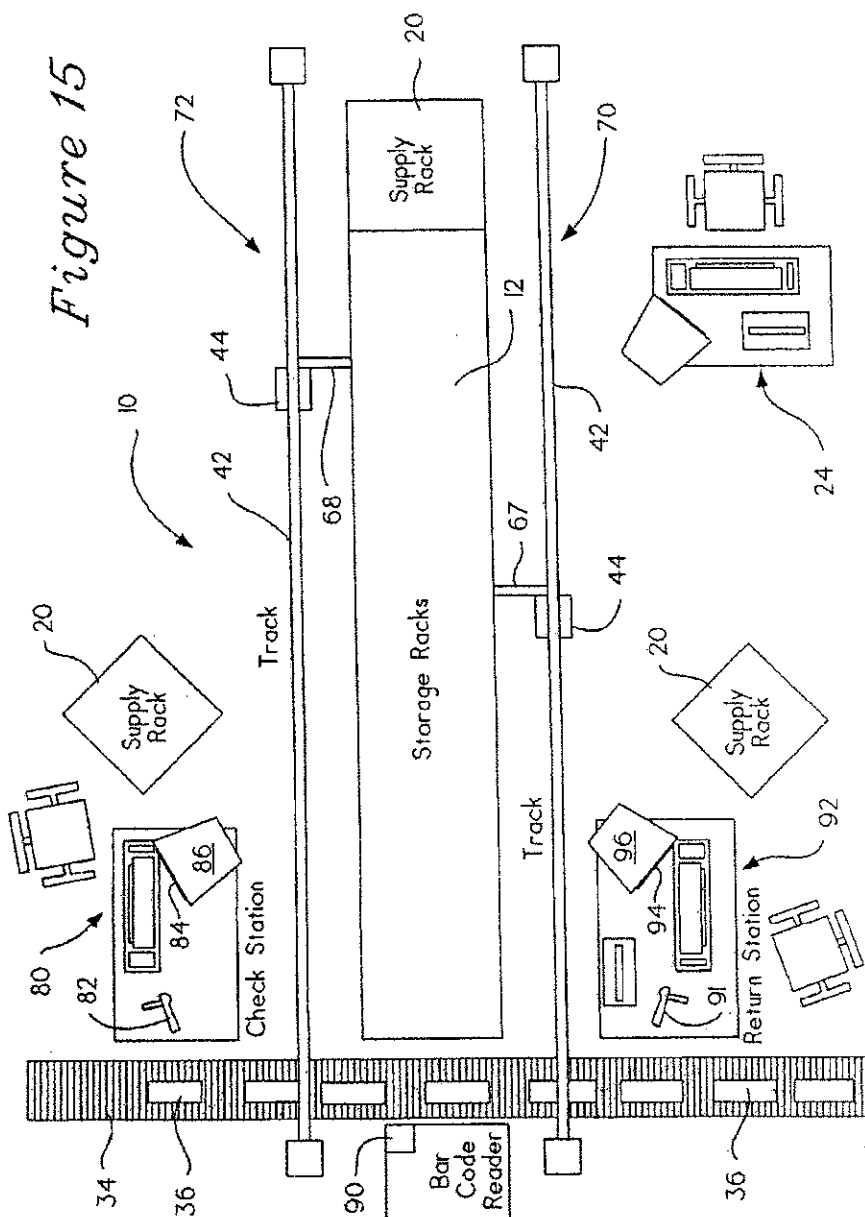


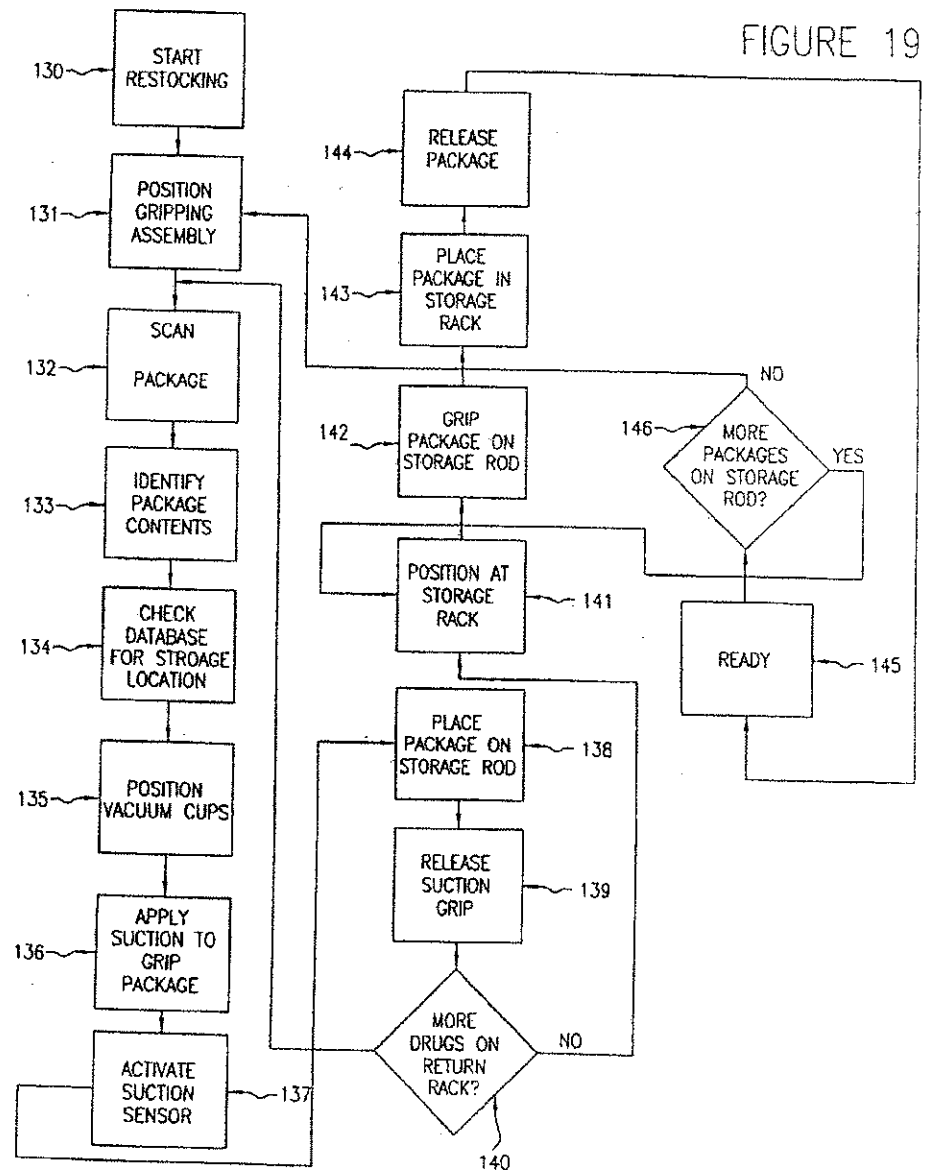
FIG. 11	FIG. 11
BY	CLASS
CRAFTSMAN	SUBCLASS

Figure 11



ATTORNEY	O.G. FIG.
BY	CLASS
DRAFTSMAN	SUBCLASS

Figure 15



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark OfficeAddress: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
08/452,646	05/25/95	McDONALD	956441

BUCHANAN INGERSOLL P.C. ONE OXFORD CENTRE 20TH FLOOR 301 GRANT STREET PITTSBURGH, PA. 15219-1410	4102/0911
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EXAMINER	
WERNER	
ART UNIT	PAPER NUMBER
3107	

DATE MAILED: 09/11/96

NOTICE OF DRAWING REQUIREMENTS

☒ Corrected/substituted drawings for the above-identified application, received in the PTO on 9-6-96, are still considered informal for the reason(s) identified on the attached Form PTO-948.

☐ Applicant has the time remaining in the response period set in the Notice of Allowability or Notice of Drawing Requirements mailed _____ to overcome the objections raised in the attached Form PTO-948. This response period may be extended under the provisions of 37 CFR 1.136 (a) by filing the appropriate request and fee before the end of the six month statutory period for response.

☒ The PTO delayed in reviewing the corrected drawings. Applicant is given ONE month time limit from the date of this letter to provide corrected drawings. NO EXTENSION OF THIS TIME LIMIT MAY BE GRANTED UNDER EITHER 37 CFR 1.136(a) or (b). See MPEP 714.03. However, the response period set in the Notice of Allowability or Notice of Drawing Requirements mailed 6-6-96 may be extended under the provisions of 37 CFR 1.136(a) by filing the appropriate request and fee before the end of the six month statutory period for response.

☐ The PTO delayed in reviewing the corrected drawings. Applicant is given ONE month time limit from the date of this letter to provide corrected drawings. NO EXTENSION OF THIS TIME LIMIT MAY BE GRANTED UNDER EITHER 37 CFR 1.136(a) or (b). See MPEP 714.03

☒ ATTACHMENT: PTO-948

FORM PTOL-455 (REV. 8-95)

Joshua Chase
PATENT AND TRADEMARK OFFICE

9-11-96
DATE

MA000436

Form PTO 948 (Rev. 10-94)

U.S. DEPARTMENT OF COMMERCE - Patent and Trademark Office

Application No. 08/452,646

NOTICE OF DRAFTSPERSON'S PATENT DRAWING REVIEW

PTO Draftpersons review all originally filed drawings regardless of whether they are designated as formal or informal. Additionally, patent Examiners will review the drawings for compliance with the regulations. Direct telephone inquiries concerning this review to the Drawing Review Branch, 703-305-8404.

The drawings filed (insert date) 9-6-96, are

A. ☒ not objected to by the Draftsperson under 37 CFR 1.84 or 1.152.

B. ☐ objected to by the Draftsperson under 37 CFR 1.84 or 1.152 as indicated below. The Examiner will require submission of new, corrected drawings when necessary. Corrected drawings must be submitted according to the instructions on the back of this Notice.

- DRAWINGS.** 37 CFR 1.84(a): Acceptable categories of drawings:
 - Black ink. Color:
 - ☐ Not black solid lines. Fig(s) _____
 - ☐ Color drawings are not acceptable until petition is granted. Fig(s) _____
- PHOTOGRAPHS.** 37 CFR 1.84(b)
 - ☐ Photographs are not acceptable until petition is granted. Fig(s) _____
 - ☐ Photographs not properly mounted (must use bristol board or photographic double-weight paper). Fig(s) _____
 - ☐ Poor quality (half-tone). Fig(s) _____
- GRAPHIC FORMS.** 37 CFR 1.84(d)
 - ☐ Chemical or mathematical formula not labeled as separate figure. Fig(s) _____
 - ☐ Group of waveforms not presented as a single figure, using common vertical axis with time extending along horizontal axis. Fig(s) _____
 - ☐ Individual waveform not identified with a separate letter designation adjacent to the vertical axis. Fig(s) _____
- TYPE OF PAPER.** 37 CFR 1.84(e)
 - ☐ Paper not flexible, strong, white, smooth, nonshiny, and durable. Sheet(s) _____
 - ☐ Erasures, alterations, overwritings, interlineations, cracks, creases, and folds copy machine marks not accepted. Fig(s) _____
 - ☐ Mylar, velum paper is not acceptable (too thin). Fig(s) _____
- SIZE OF PAPER.** 37 CFR 1.84(f): Acceptable sizes:
 - 21.6 cm. by 35.6 cm. (8 1/2 by 14 inches)
 - 21.6 cm. by 33.1 cm. (8 1/2 by 13 inches)
 - 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches)
 - 21.0 cm. by 29.7 cm. (DIN size A4)
 - ☐ All drawing sheets not the same size. Sheet(s) _____
 - ☐ Drawing sheet not an acceptable size. Sheet(s) _____
- MARGINS.** 37 CFR 1.84(g): Acceptable margins:

Paper size				
21.6 cm. X 35.6 cm. (8 1/2 X 14 inches)	21.6 cm. X 33.1 cm. (8 1/2 X 13 inches)	21.6 cm. X 27.9 cm. (8 1/2 X 11 inches)	21.0 cm. X 29.7 cm. (DIN size A4)	
T 3.1 cm. (1 1/8")	2.5 cm. (1")	2.5 cm. (1")	2.5 cm. (1")	
L .64 cm. (1/4")	.64 cm. (1/4")	.64 cm. (1/4")	.64 cm. (1/4")	1.3 cm. (1/2")
R .64 cm. (1/4")	.64 cm. (1/4")	.64 cm. (1/4")	.64 cm. (1/4")	1.0 cm. (3/8")

Margins do not conform to chart above.

Sheet(s) Fig. 10, 16-18

Top (T) _____ Left (L) _____ Right (R) _____ Bottom (B) _____
- VIEWS.** 37 CFR 1.84(h)
 - REMINDER: Specification may require revision to correspond to drawing changes.
 - ☐ All views not grouped together. Fig(s) _____
 - ☐ Views connected by projection lines or lead lines. Fig(s) _____
 - ☐ Partial views. 37 CFR 1.84(h) 2
 - ☐ View and enlarged view not labeled separately or properly. Fig(s) _____
 - ☐ Sectional views. 37 CFR 1.84 (h) 3
 - ☐ Hatching not indicated for sectional portions of an object. Fig(s) _____
 - ☐ Cross section not drawn same as view with parts in cross section with regularly spaced parallel oblique strokes. Fig(s) _____
- ARRANGEMENT OF VIEWS.** 37 CFR 1.84(i)
 - ☐ Words do not appear on a horizontal, left-to-right fashion when page is either upright or turned so that the top becomes the right side, except for graphs. Fig(s) _____
- SCALE.** 37 CFR 1.84(k)
 - ☐ Scale not large enough to show mechanism with crowding when drawing is reduced in size to two-thirds in reproduction. Fig(s) _____
 - ☐ Indication such as "actual size" or scale 1/2" not permitted. Fig(s) _____
- CHARACTER OF LINES, NUMBERS, & LETTERS.** 37 CFR 1.84(l)
 - ☐ Lines, numbers & letters not uniformly thick and well defined, clean, durable, and black (except for color drawings). Fig(s) _____
- SHADING.** 37 CFR 1.84(m)
 - ☐ Solid black shading areas not permitted. Fig(s) _____
 - ☐ Shade lines, pale, rough and blurred. Fig(s) _____
- NUMBERS, LETTERS, & REFERENCE CHARACTERS.** 37 CFR 1.84(p)
 - ☐ Numbers and reference characters not plain and legible. 37 CFR 1.84(p)(1) Fig(s) _____
 - ☐ Numbers and reference characters not oriented in same direction as the view. 37 CFR 1.84(p)(1) Fig(s) _____
 - ☐ English alphabet not used. 37 CFR 1.84(p)(2) Fig(s) _____
 - ☐ Numbers, letters, and reference characters do not measure at least .32 cm. (1/8 inch) in height. 37 CFR(p)(3) Fig(s) 2
- LEAD LINES.** 37 CFR 1.84(q)
 - ☐ Lead lines cross each other. Fig(s) _____
 - ☐ Lead lines missing. Fig(s) _____
- NUMBERING OF SHEETS OF DRAWINGS.** 37 CFR 1.84(t)
 - ☐ Sheets not numbered consecutively, and in Arabic numerals, beginning with number 1. Sheet(s) _____
- NUMBER OF VIEWS.** 37 CFR 1.84(u)
 - ☐ Views not numbered consecutively, and in Arabic numerals, beginning with number 1. Fig(s) _____
 - ☐ View numbers not preceded by the abbreviation Fig. Fig(s) _____
- CORRECTIONS.** 37 CFR 1.84(w)
 - ☒ Corrections not made from prior PTO-948. Fig(s) 16-18
- DESIGN DRAWING.** 37 CFR 1.152
 - ☐ Surface shading shown not appropriate. Fig(s) _____
 - ☐ Solid black shading not used for color contrast. Fig(s) _____

COMMENTS:

ATTACHMENT TO PAPER NO. 11REVIEWER J. CHASEDATE 9-11-96

MA000437

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit 3107 : PATENT
Examiner F. Werner :
In re application of : AN AUTOMATED SYSTEM
Sean C. McDonald : FOR SELECTING AND
Serial No. 08/452,646 : DELIVERING PACKAGES
Filed May 25, 1995 : FROM A STORAGE AREA
Allowed June 6, 1996 :

LETTER

Pittsburgh, Pennsylvania 15219

October 4, 1996

Hon. Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

Please substitute the enclosed six (6) sheets of drawings containing Figures 2, 10, 16, 17, 18 and 19 for those filed on September 9, 1996. These drawings are believed to overcome the objections raised by the Official Draftsman to the figures previously submitted.

A copy of the Draftsman's Objections is also enclosed.

Respectfully submitted,

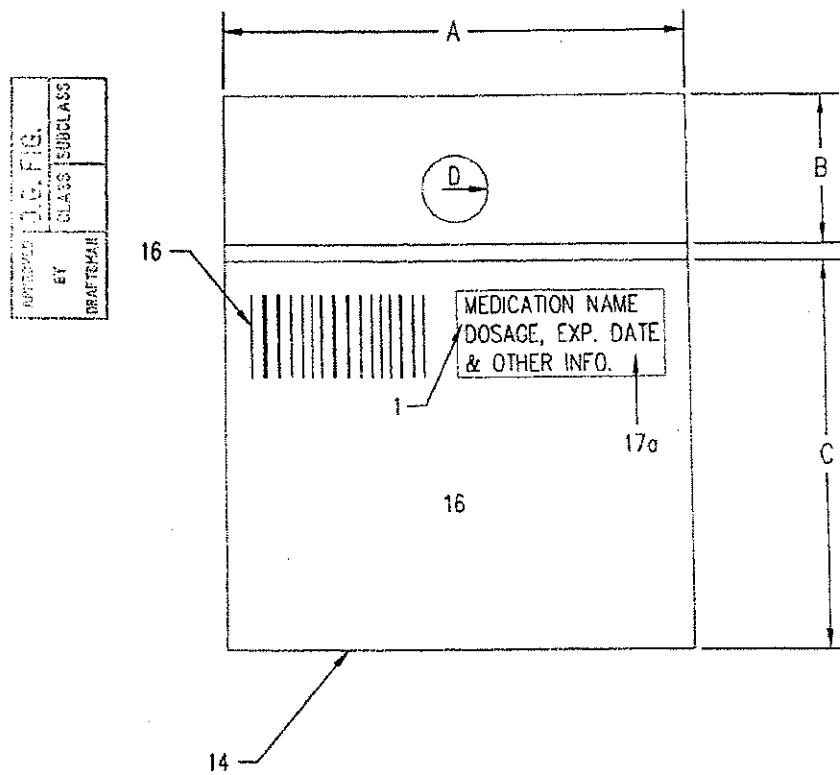
BUCHANAN INGERSOLL, P.C.

By Lynn J. Alstadt
Lynn J. Alstadt
Registration No. 29,362

(412) 562-1632

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FIGURE 2



APPROVED	U.S. FIG.
BY	CLASS
CRAFTSMAN	ISURCLASS

FIGURE 10

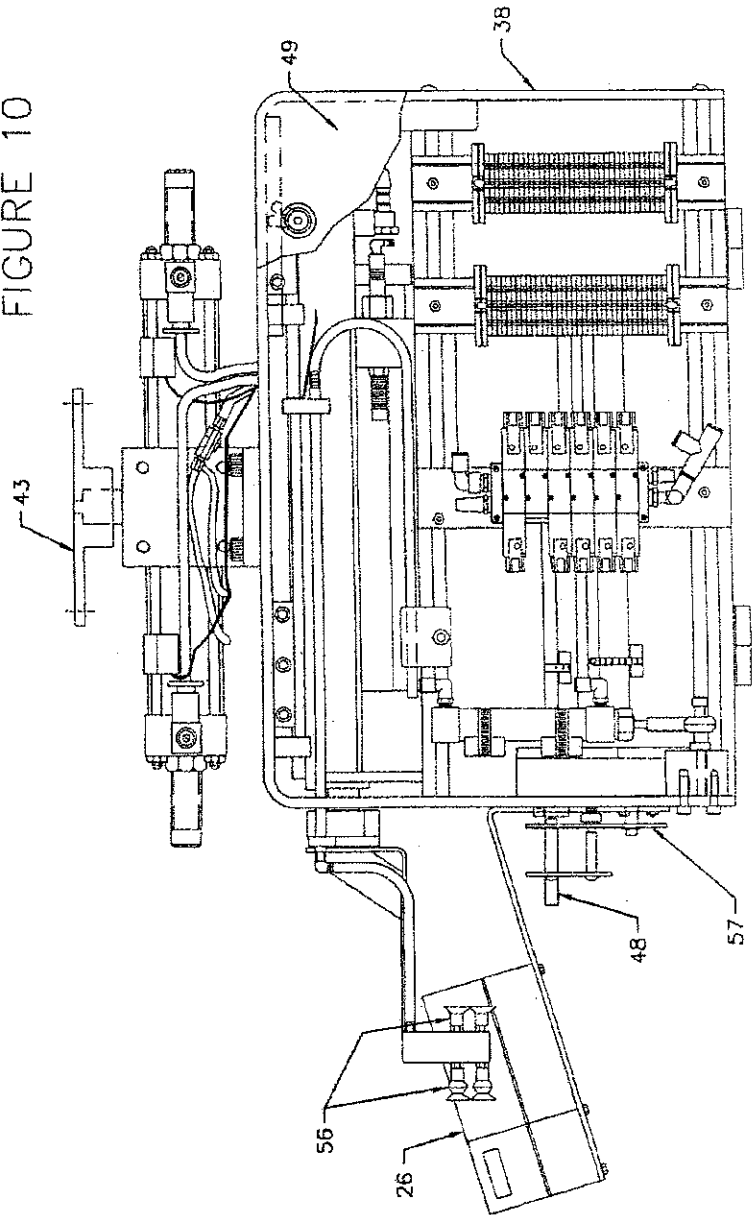


FIGURE 16

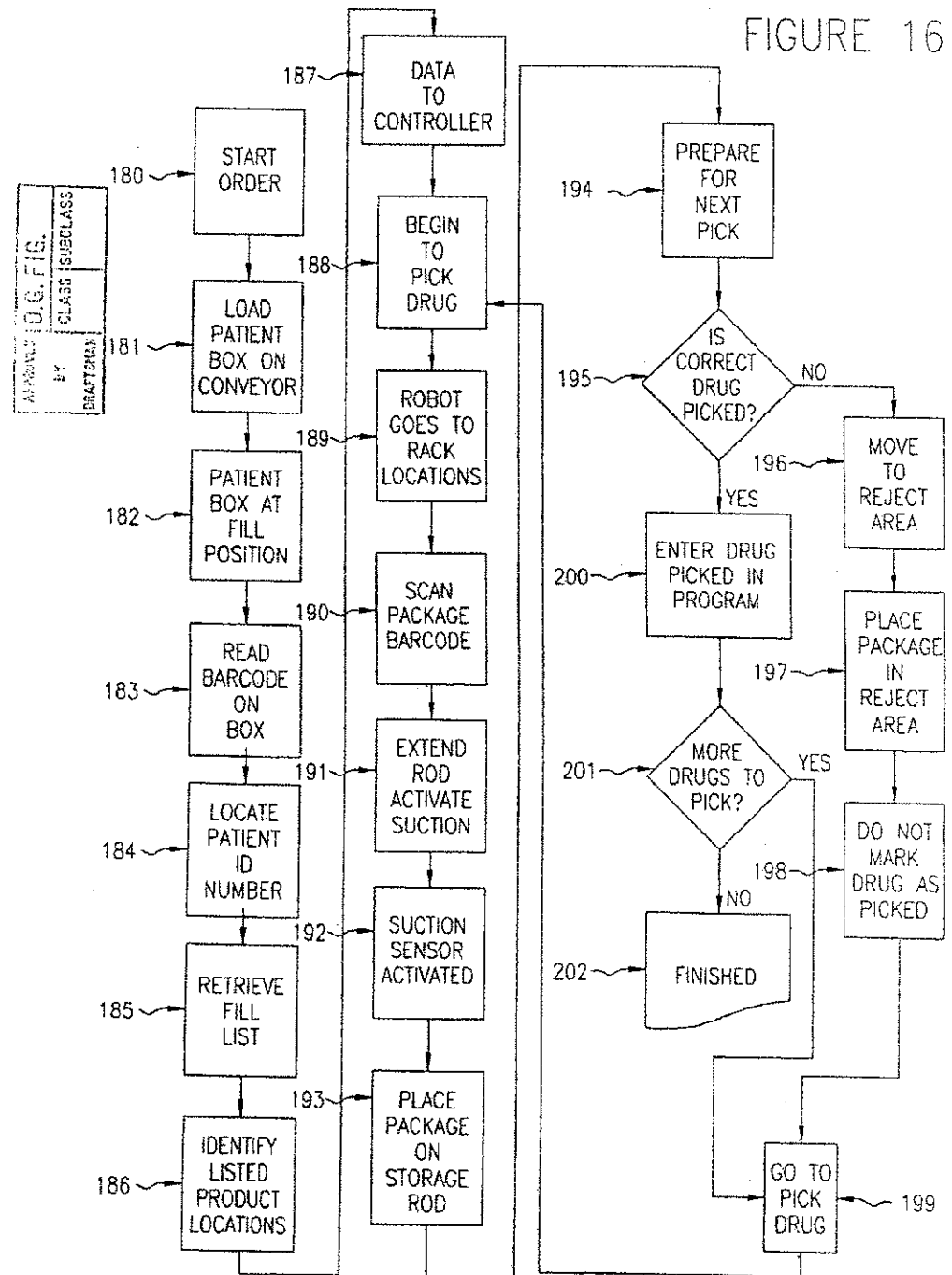
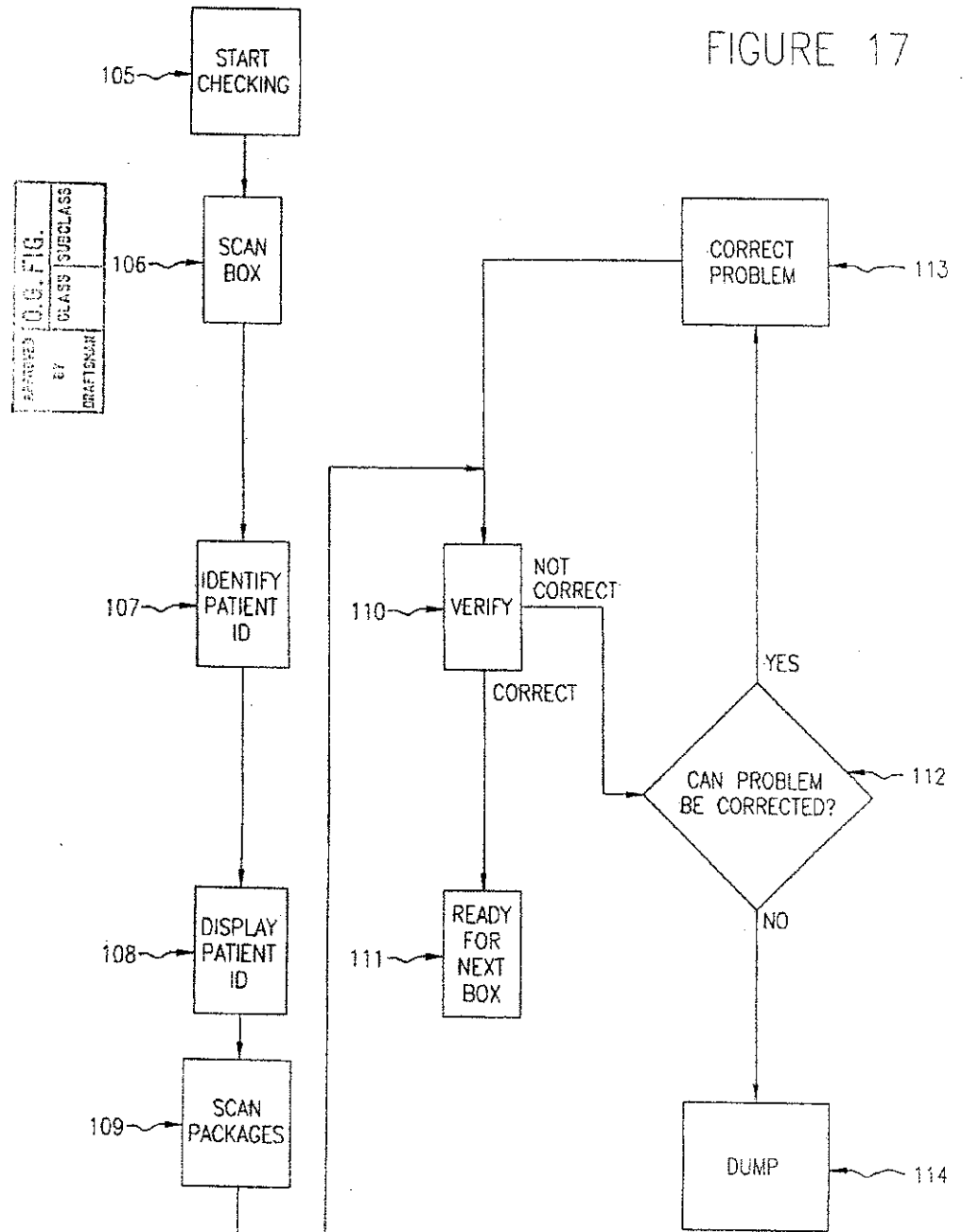
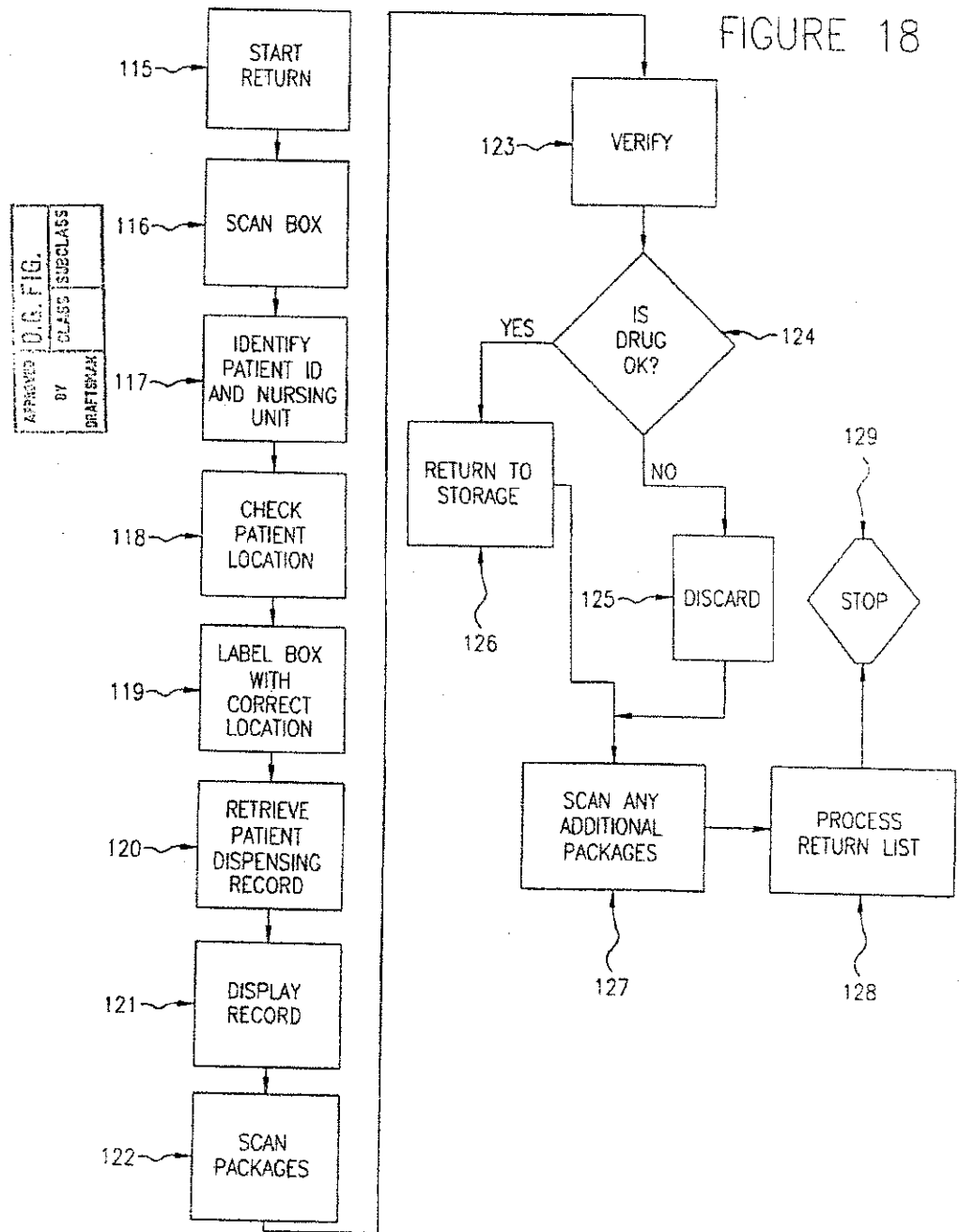
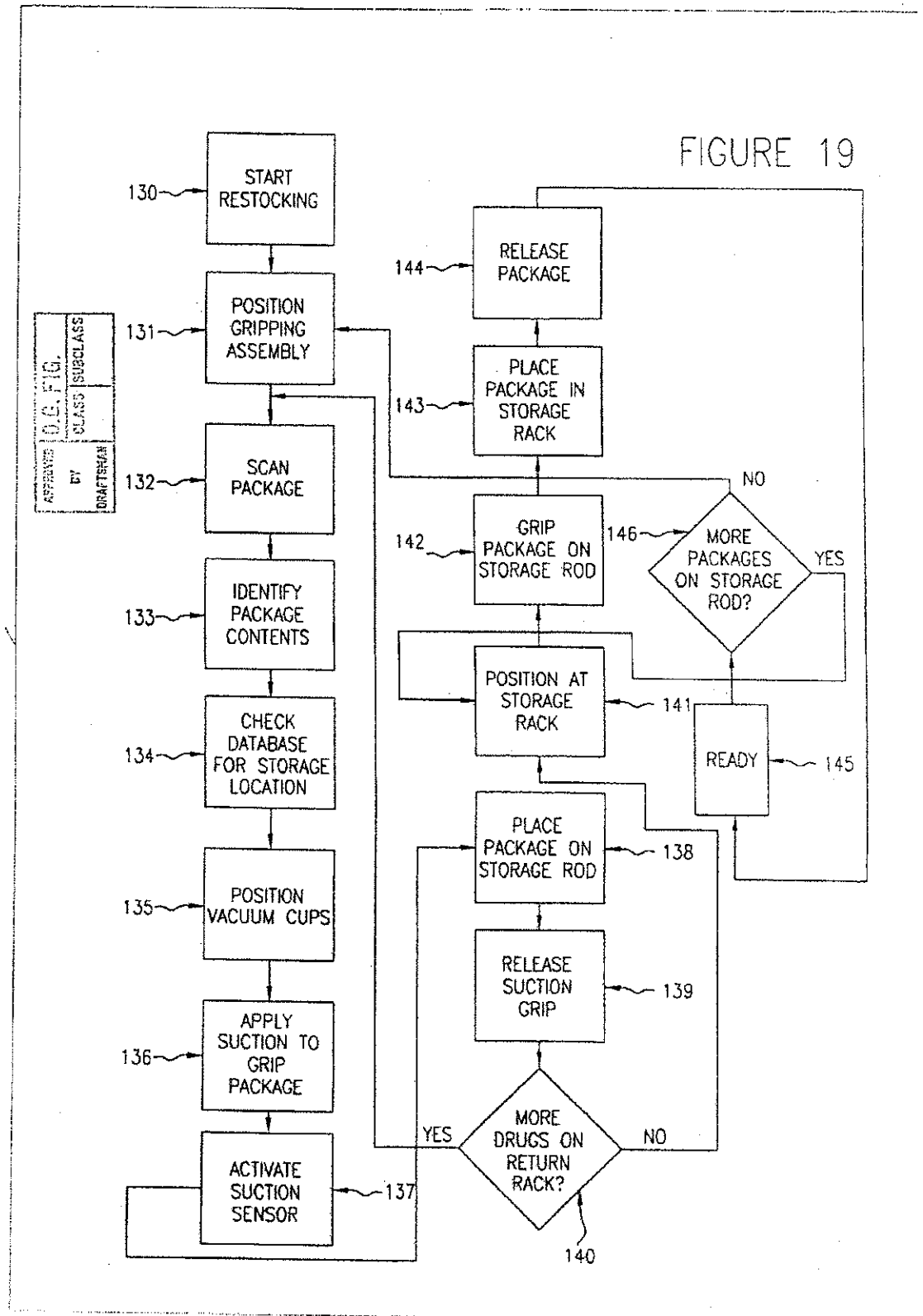


FIGURE 17







The
United
States
of
America



PTO UTILITY GRANT

Paper Number 13

The Commissioner of Patents
and Trademarks

Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America for the term set forth below, subject to the payment of maintenance fees as provided by law.

If this application was filed prior to June 8, 1995, the term of this patent is the longer of seventeen years from the date of grant of this patent or twenty years from the earliest effective U.S. filing date of the application, subject to any statutory extension.

If this application was filed on or after June 8, 1995, the term of this patent is twenty years from the earliest effective U.S. filing date of the application, subject to any statutory extension.

Bruce Lehman

Commissioner of Patents and Trademarks

Margaret V. James

Attest

Form PTO-1584 (Rev. 5/96)

(RIGHT INSIDE)

MA000445

PATENT APPLICATION FEE DETERMINATION RECORD						Application or Docket Number			
Effective October 1, 1994						052646			
CLAIMS AS FILED - PART I									
(Column 1)		(Column 2)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY			
FOR	NUMBER FILED	NUMBER EXTRA	RATE	FEE	RATE	FEE	OR		
BASIC FEE				365.00		730.00	OR		
TOTAL CLAIMS	12	minus 20 =	x\$11=		x\$22=		OR		
INDEPENDENT CLAIMS	1	minus 3 =	x38=		x76=		OR		
MULTIPLE DEPENDENT CLAIM PRESENT:			+120=		+240=		OR		
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	365	TOTAL		OR		
CLAIMS AS AMENDED - PART II									
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE	OR	ADDITIONAL FEE
Total	*	Minus **	=	x\$11=		x\$22=		OR	ADDITIONAL FEE
Independent	*	Minus ***	=	x38=		x76=		OR	ADDITIONAL FEE
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM			+120=		+240=		OR	ADDITIONAL FEE	TOTAL
TOTAL ADDIT. FEE				TOTAL		TOTAL		OR	ADDITIONAL FEE
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE	OR	ADDITIONAL FEE
Total	*	Minus **	=	x\$11=		x\$22=		OR	ADDITIONAL FEE
Independent	*	Minus ***	=	x38=		x76=		OR	ADDITIONAL FEE
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM			+120=		+240=		OR	ADDITIONAL FEE	TOTAL
TOTAL ADDIT. FEE				TOTAL		TOTAL		OR	ADDITIONAL FEE
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY	
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE	OR	ADDITIONAL FEE
Total	*	Minus **	=	x\$11=		x\$22=		OR	ADDITIONAL FEE
Independent	*	Minus ***	=	x38=		x76=		OR	ADDITIONAL FEE
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM			+120=		+240=		OR	ADDITIONAL FEE	TOTAL
TOTAL ADDIT. FEE				TOTAL		TOTAL		OR	ADDITIONAL FEE

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
 ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
 *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
 The Highest Number Previously Paid For (Total or Independent) is the highest number found in the appropriate box in column 1.

FORM PTO-875
(Rev. 10/94)

Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

MA000446

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET (FOR USE WITH FORM PTO-875)							SERIAL NO.	FILING DATE				
							APPLICANT(S)					
							CLAIMS					
AS FILED		AFTER 1st AMENDMENT		AFTER 2nd AMENDMENT								
IND.	DEP.	IND.	DEP.	IND.	DEP.							
1						51						
2						52						
3						53						
4						54						
5						55						
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49						99						
50						100						
TOTAL IND.						TOTAL IND.						
TOTAL DEP.						TOTAL DEP.						
TOTAL CLAIMS						TOTAL CLAIMS						

PTO-1360 (3-78)

*MAY BE USED FOR ADDITIONAL CLAIMS OR AMENDMENTS

U.S. DEPARTMENT OF COMMERCE
Patent and Trademark Office

PAGE DATA ENTRY CODING SHEET										U.S. DEPARTMENT OF COMMERCE Patent and Trademark Office	
APPLICATION NUMBER										DATE	
19/452646										6-21-95	
TOTAL CLAIMS										SHEETS OF DRAWING	
12										19	
INDEPENDENT CLAIMS										DATE	
1											
SMALL ENTITY?										DATE	
2											
FILING FEE										DATE	
365											
FOREIGN LICENSE										DATE	
1											
ATTORNEY DOCKET NUMBER										DATE	
954441											
CONTINUITY DATA										DATE	
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PARENT PATENT NUMBER										DATE	
PARENT FILING DATE										DATE	
PCT/FOREIGN APPLICATION SERIAL NUMBER										DATE	
PCT/FOREIGN FILING DATE										DATE	
FOREIGN PRIORITY CLAIMED										DATE	
COUNTRY CODE										DATE	
PCT/FOREIGN APPLICATION SERIAL NUMBER										DATE	
PCT/FOREIGN FILING DATE										DATE	

CONT STATUS CODE	PARENT APPLICATION SERIAL NUMBER	PCT APPLICATION SERIAL NUMBER	PARENT PATENT NUMBER	PARENT FILING DATE
1	2	PCT	1	1995
2	3	PCT	1	1995
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